Service Source

iMac (Flat Panel)

Updated April 18, 2002

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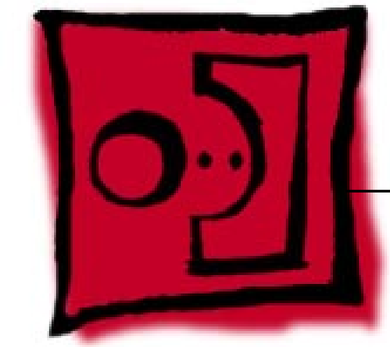
Service Source



Take Apart

iMac (Flat Panel)

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Service Source

iMac (Flat Panel)

Updated March 5, 2002

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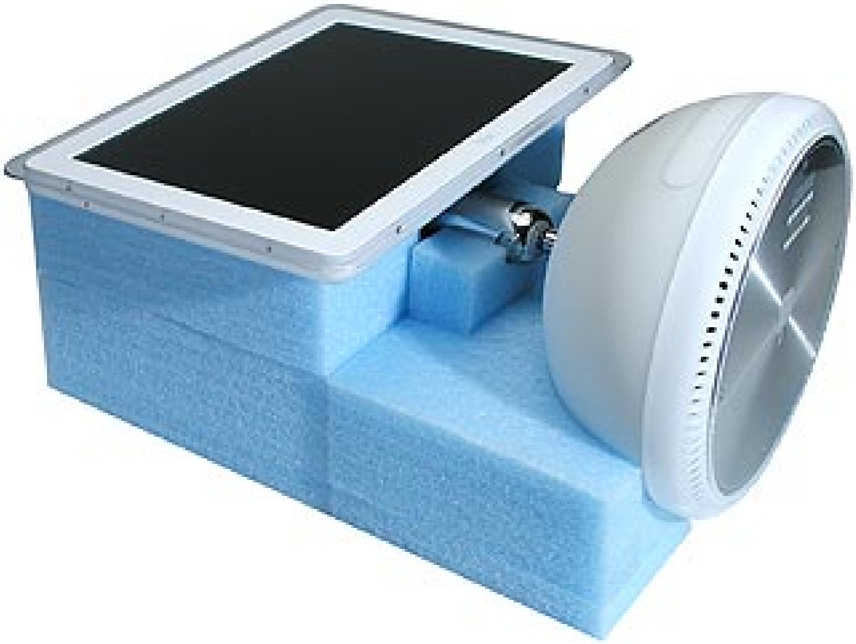
Tools

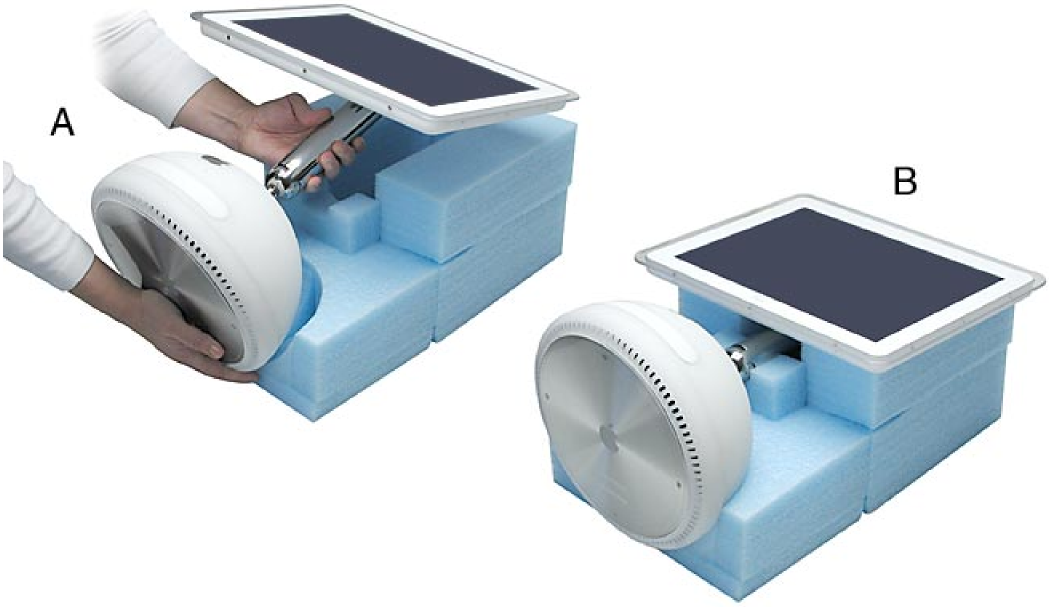
The following tools are recommended for the take apart procedures.

- service repair kit (076-0900) includes:
  - – the service stand (076-0898)
  - – diagnostic cables (076-0897)
- thermal paste (922-4757)
- torque driver (076-0899)
- 1.5 mm hex driver (for LCD bezel screws)
- phillips #0 screwdriver)
- torx screwdriver set (6, 8, 10, 15, 20)
- plastic flatblade screwdriver or stylus
- needlenose pliers
- ESD wriststrap and mat

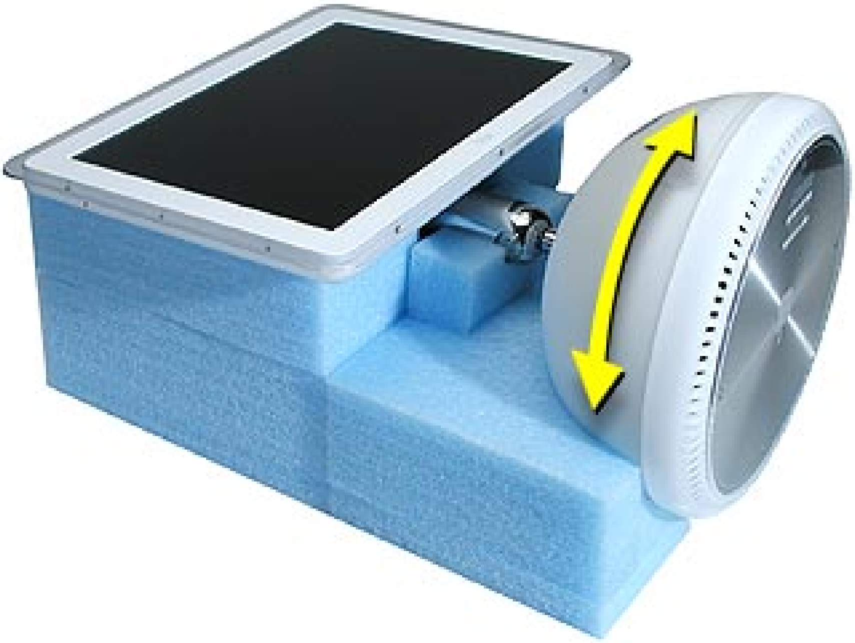
Service Stand



1. Support the computer by neck and the base (A). Gently position the computer in the service stand with the flat panel facing up (B).



2. **Note:** The base of the computer can be rotated when servicing internal parts.



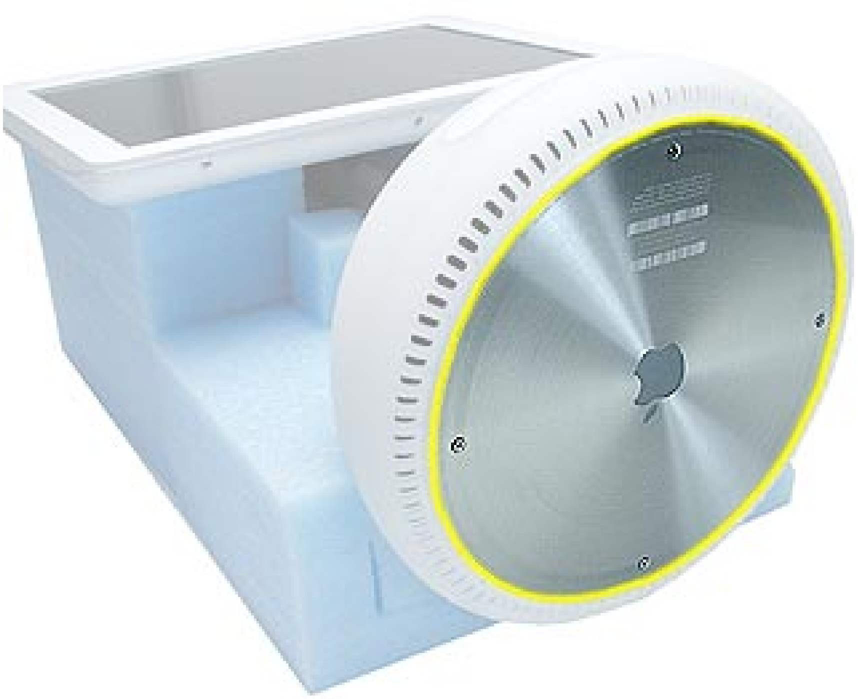
User Access Plate

Tools

This procedure requires the following tools:

- Phillips #0 screwdriver

Part Location



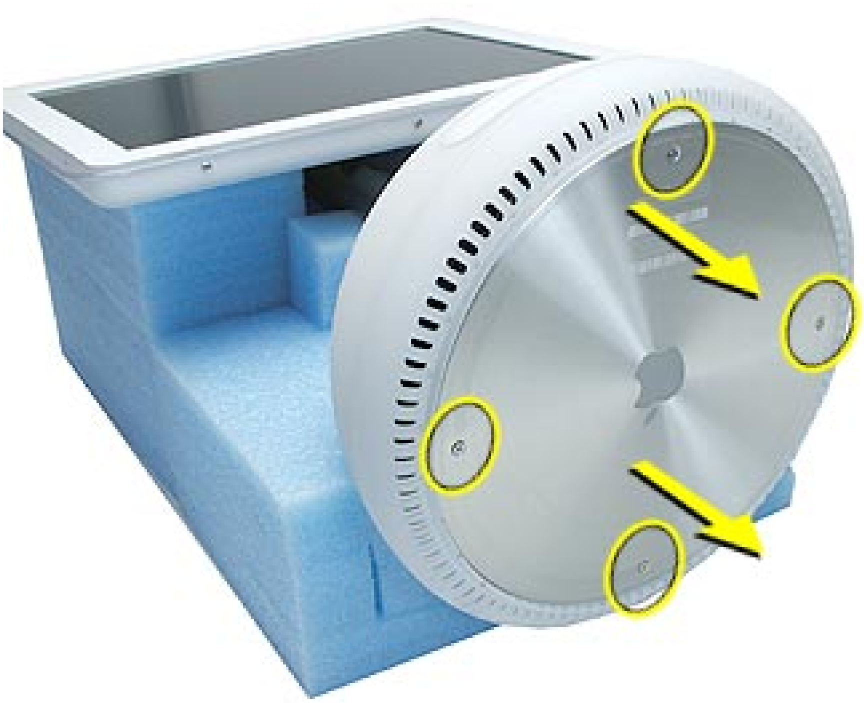
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.

Procedure

1. Loosen the four captive screws on the access panel.
2. Remove the panel by grabbing onto two captive screws and lift the panel off the base.

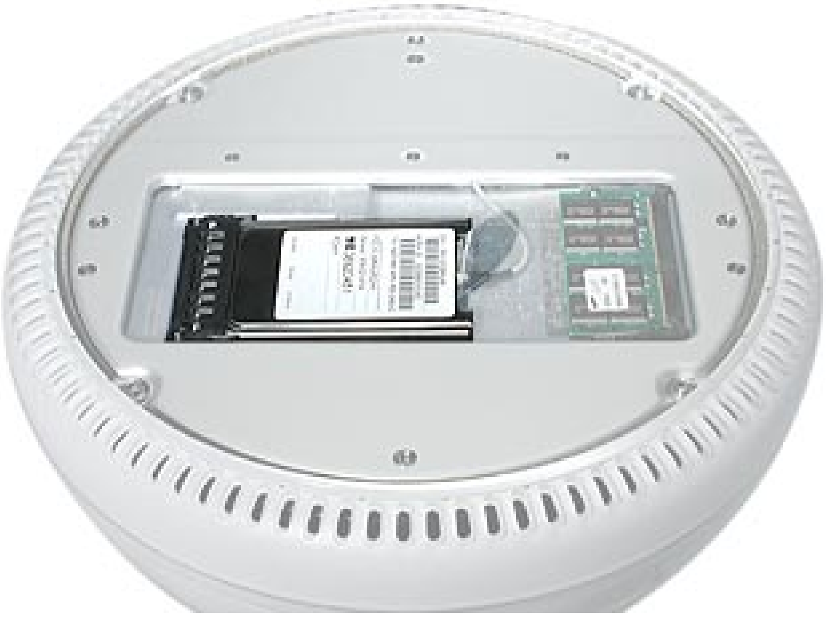


AirPort Card

Tools

This procedure requires no tools.

Part Location



Preliminary Steps

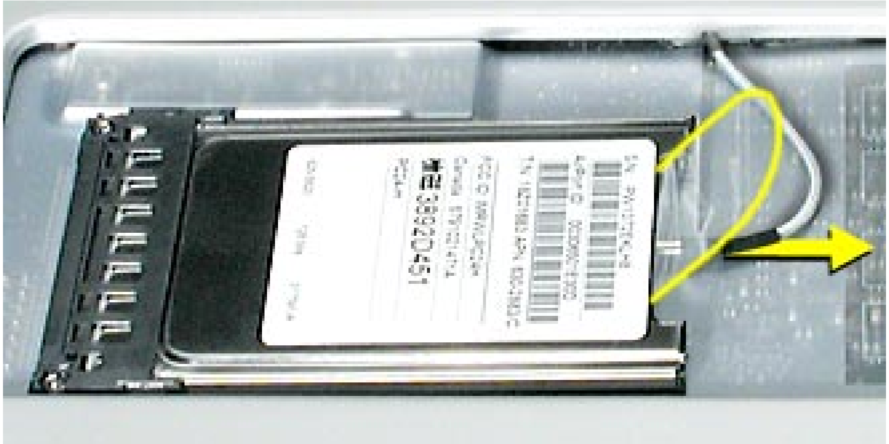
Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.

Procedure

1. Unplug all cables from the computer except the power cord.
2. **Important:** To avoid electrostatic discharge, always ground yourself by touching metal before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed the installation and closed the computer.
3. Touch a metal surface inside the computer to ground yourself.

4. Unplug the power cord.
5. Disconnect the AirPort antenna and pull the plastic tab to remove the card from the slot.

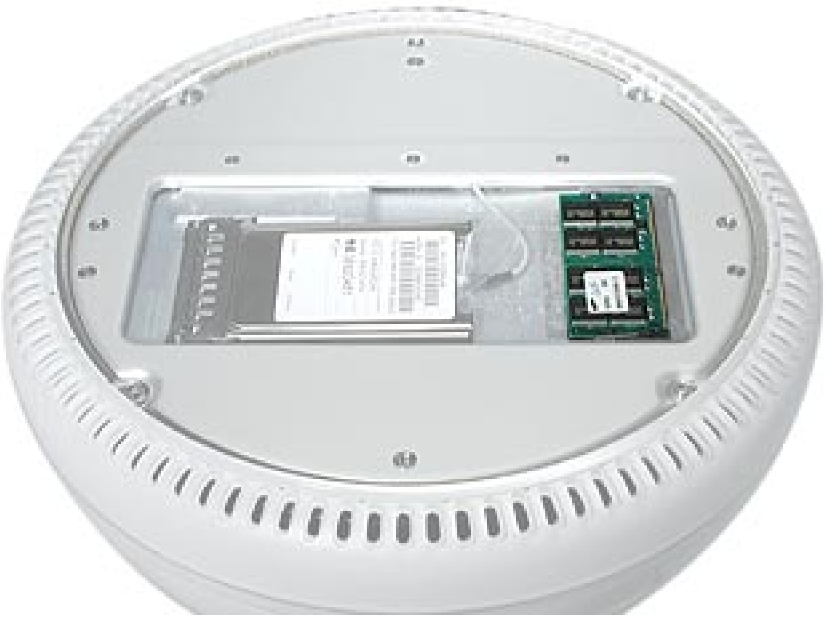


Memory, SO-DIMM (user-installable)

Tools

No tools are required for this procedure.

Part Location



Preliminary Steps

Before you begin, do the following:

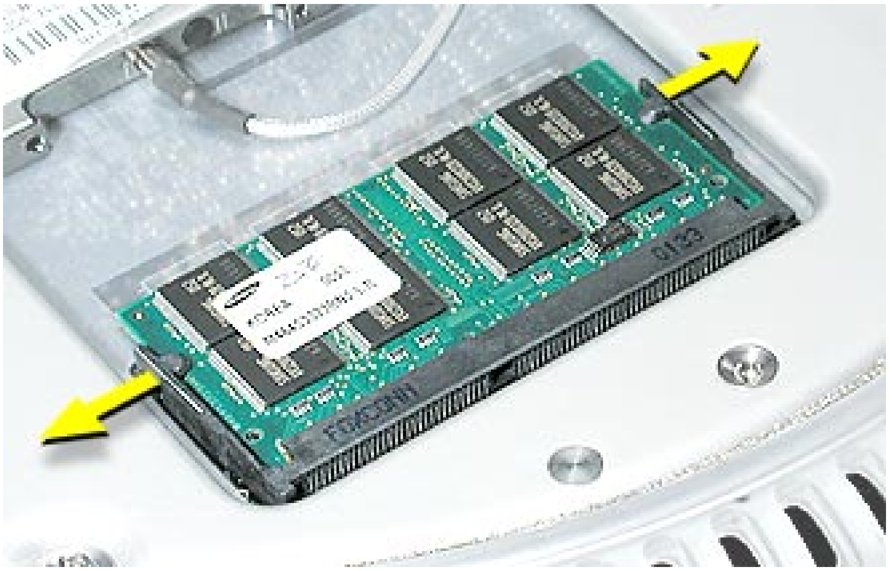
- Position the computer in the service stand.
- Remove the user access plate.

Note: There are two RAM expansion slots on the computer. One slot (top of the logic board) accepts the factory-installed standard PC-133 168-pin DIMM. The other slot (bottom of logic board) accepts a standard PC-133 144-pin SO-DIMM and is accessible on the bottom of the computer. Only the SO-DIMM slot is accessible by the user.

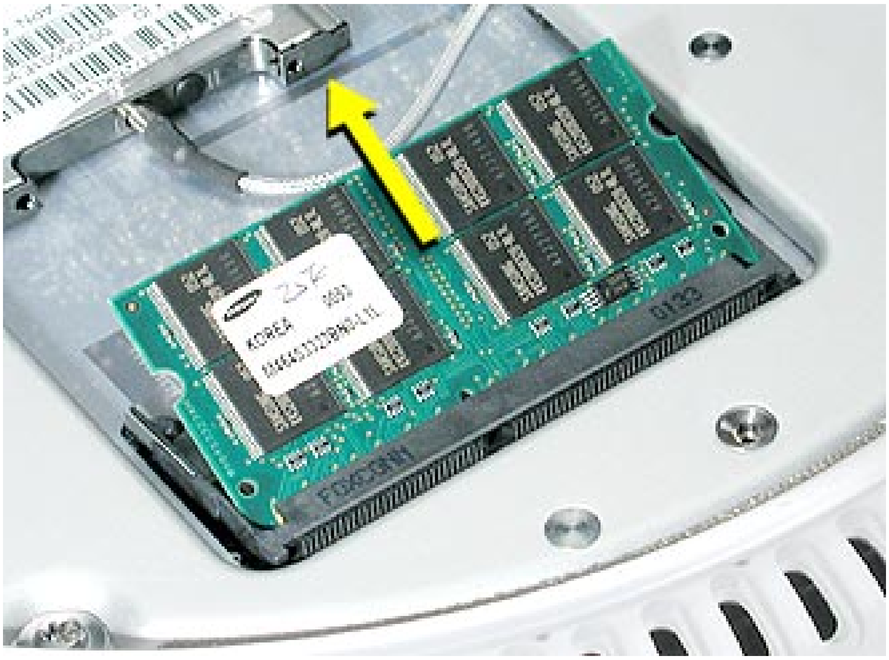
Procedure

1. Unplug all cables from the computer except the power cord.
2. **Important:** To avoid electrostatic discharge, always ground yourself by touching metal before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed the installation and closed the computer.
3. Touch a metal surface inside the computer to ground yourself.

4. Unplug the power cord.
5. Push the tabs outward to release the memory.



6. Remove the memory from the slot.



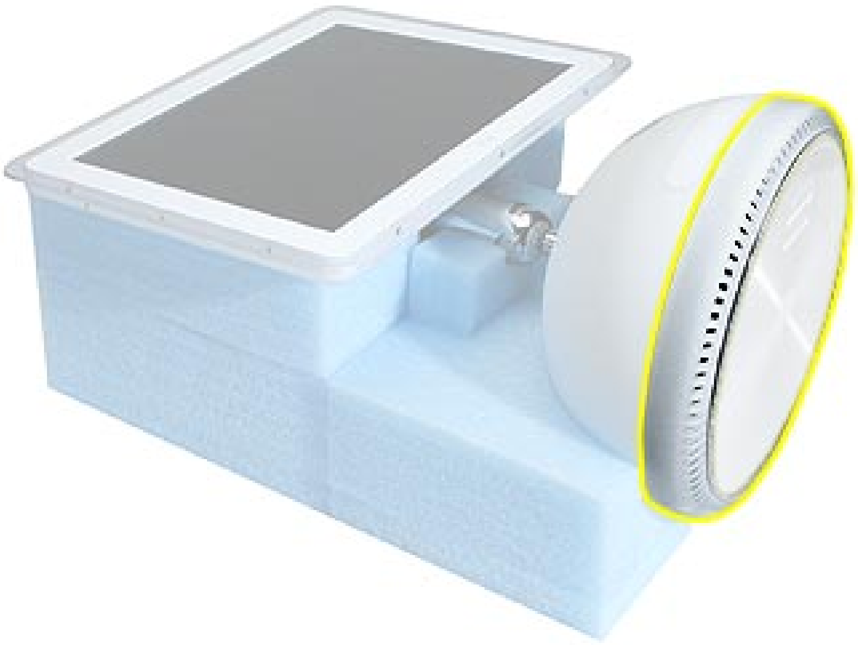
Bottom Housing

Tools

This procedure requires the following tools:

- Torx-15 screwdriver

Part Location



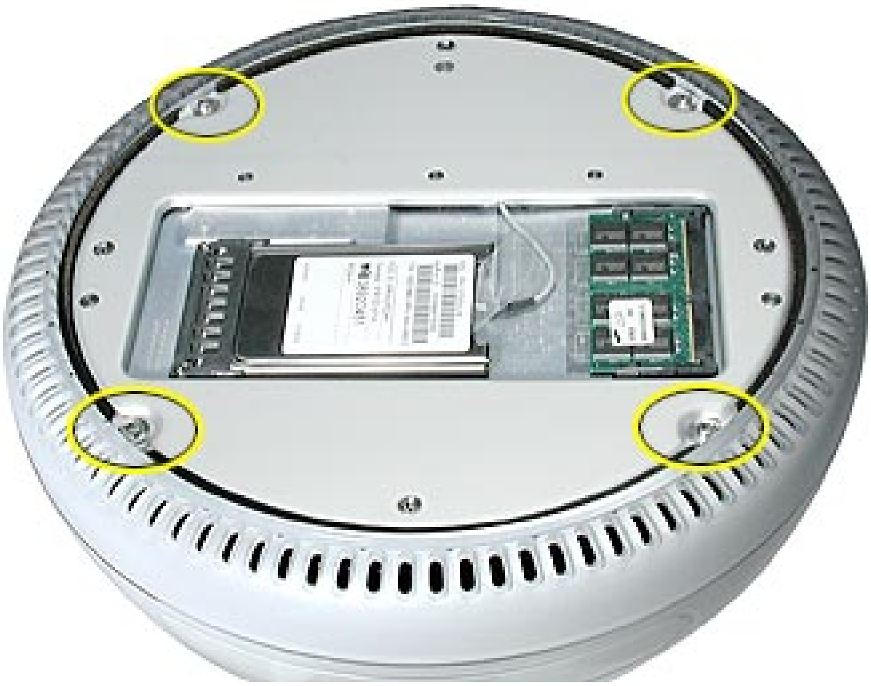
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.

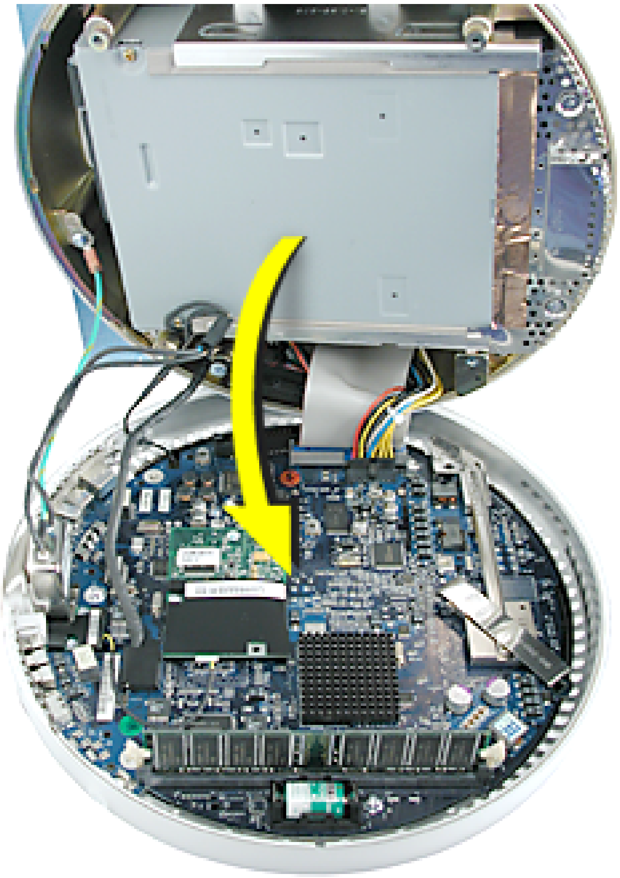
Procedure

1. Remove the four torx screws.



Replacement Note: These torx screws must be tightened to at least 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. For more information, refer to "Thermal Paste Application'" in this chapter.Rotate the base so that the optical drive door is on the right.

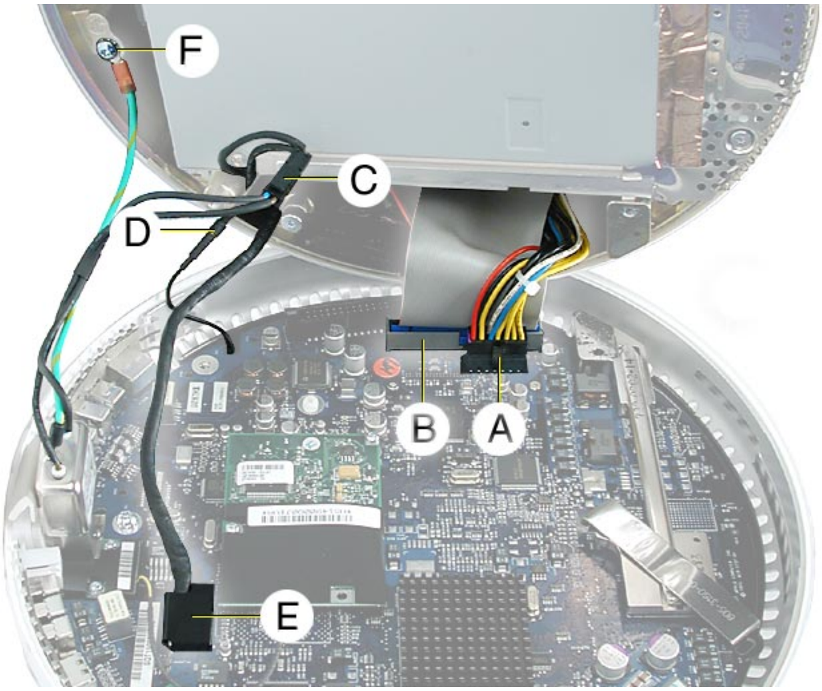
2. Gently pull the bottom housing away from the base in the direction of the arrow. **Note:** Cables are still attached to the logic board.



3. Disconnect the following:

   A Power supply connector
   B Hard drive/optical drive data cable
   C AC line filter connector
   D AirPort antenna connector
   E Plastic cable retainer and video cable
   F Grounding screw

Note: View the document at a larger size to enlarge this graphic**.**



4. Set the bottom housing aside.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe..

2.You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs.. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

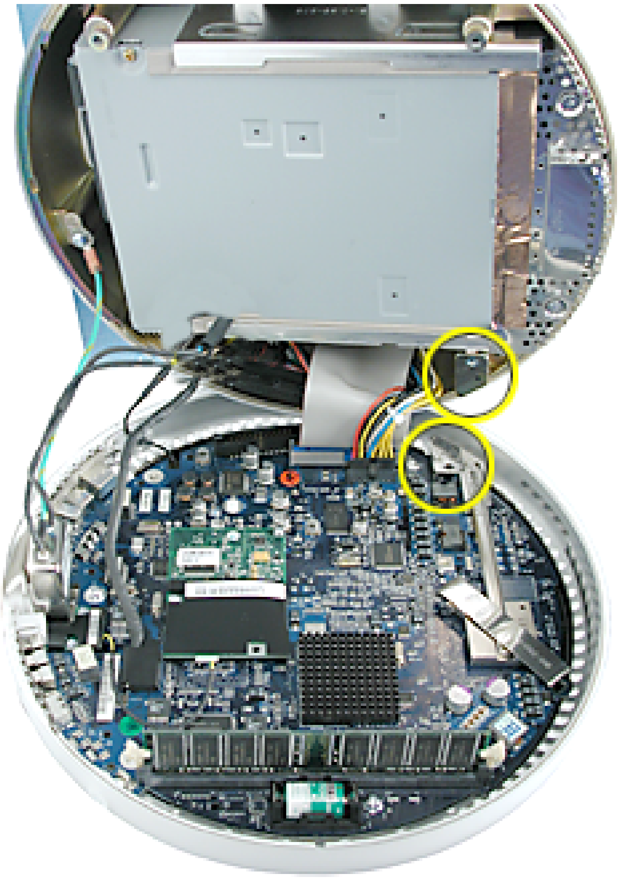
Thermal Paste Application

Tools

This procedure requires the following tools:

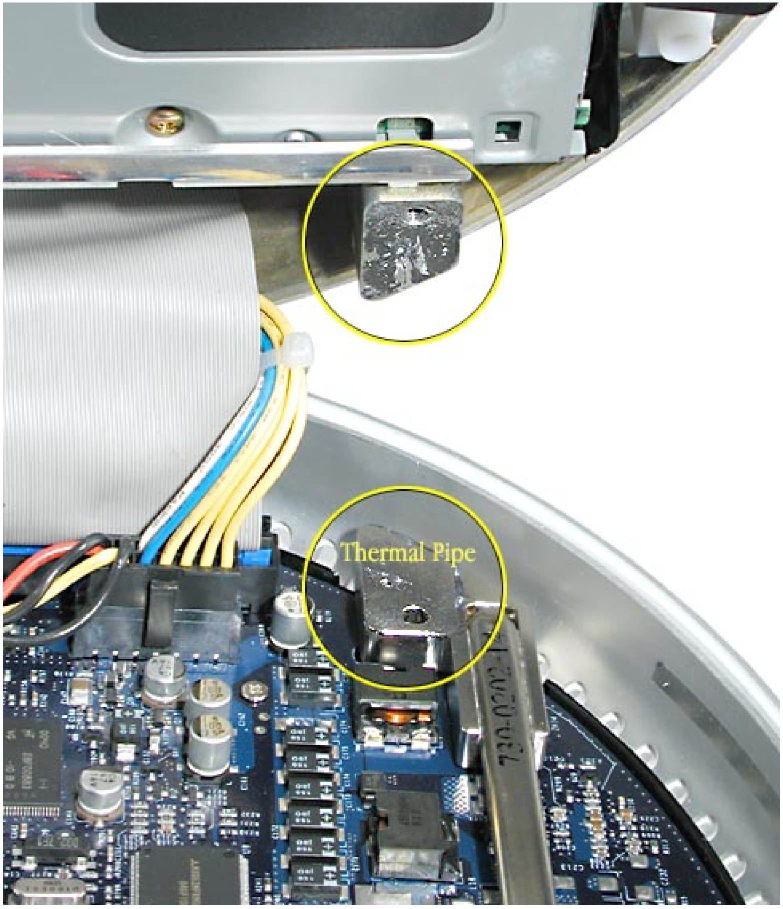
- Plastic stylus or plastic spatula to remove the old thermal paste
- Plastic stylus or plastic spatula to spread the thermal paste
- Thermal paste (922-4757)

Part Location



Procedure

1. Thoroughly clean the original thermal film from the mating surfaces (circled below) of the bottom housing and thermal pipe. Use a plastic stylus to scrape the surfaces clean. **Note:** Do not use an abrasive material or liquid cleaner.



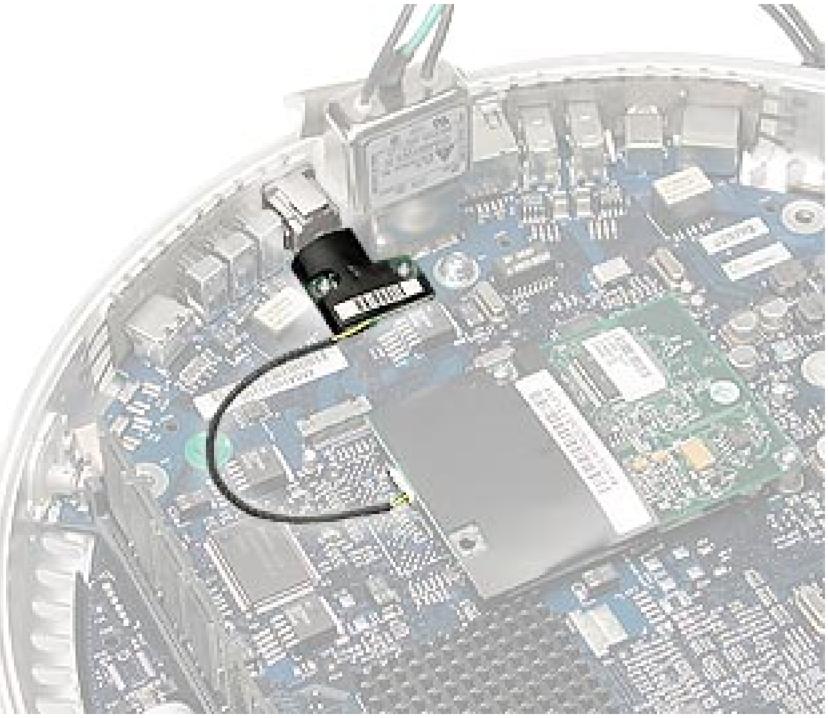
2. Squeeze a thin film of thermal paste onto the thermal pipe. Spread the paste evenly.
3. Replace the bottom housing. **Warning:** The bottom housing has four torx screws that must be tightened to at least 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged.

RJ-11 Modem Filter Board

Tools

This procedure requires the following tools:
- Torx-6 screwdriver

Part Location

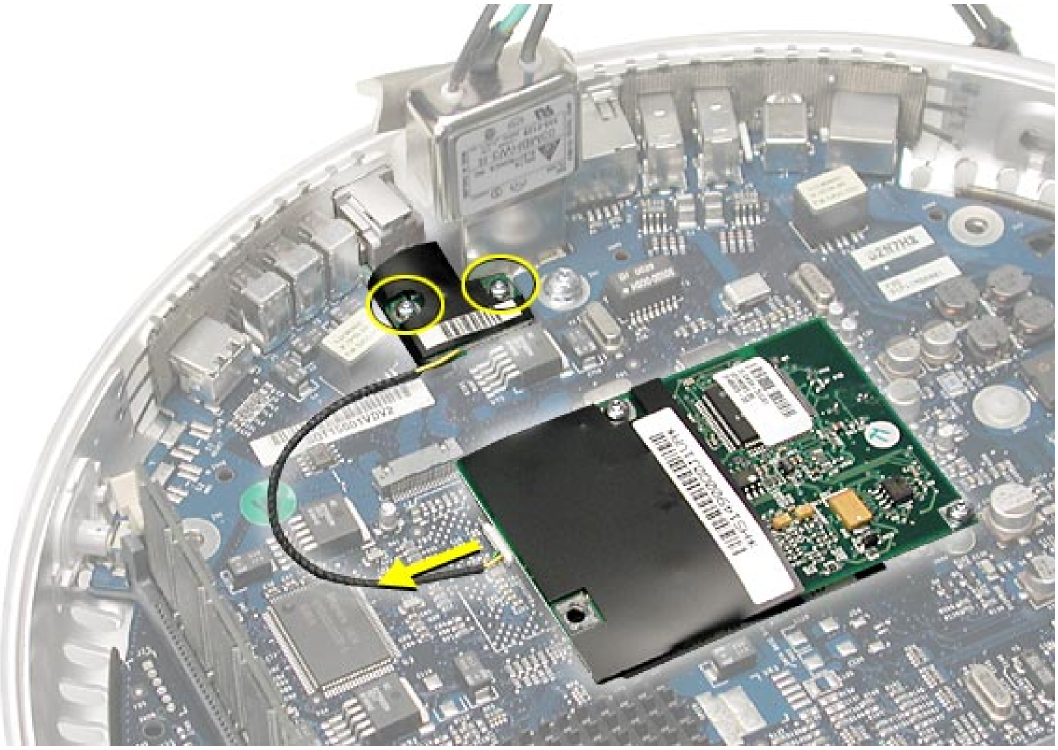


Preliminary Steps

Before you begin, do the following:
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.

Procedure

1. Remove two screws and disconnect the cable from the modem.



2. Remove the RJ-11 board from the I/O port.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1. You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

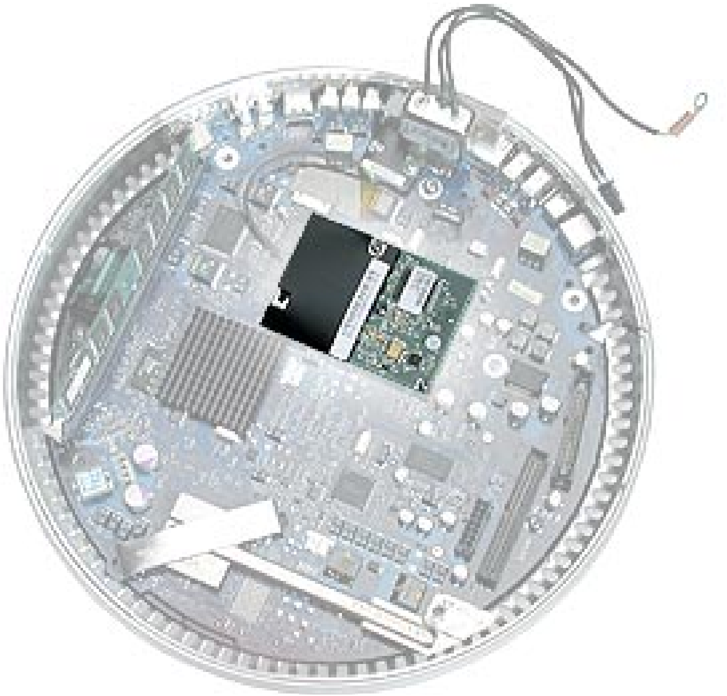
Modem

Tools

This procedure requires the following tools:

- Torx-8 screwdriver

Part Location



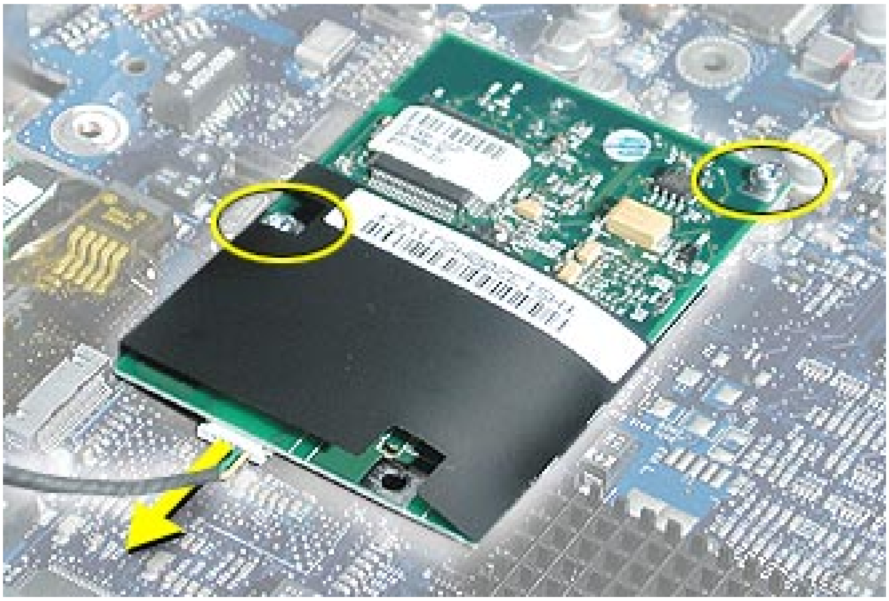
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.

Procedure

1. Remove two screws and disconnect the cable.



2. Lift the modem from the connector on the logic board.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1. You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2.You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

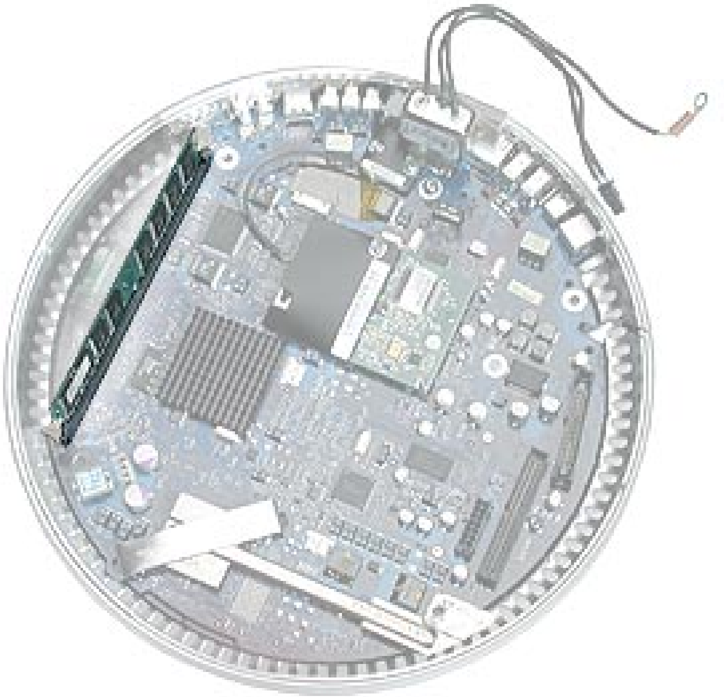
Memory (factory-installed)

Tools

This procedure requires the following tools:

- No tools are required

Part Location



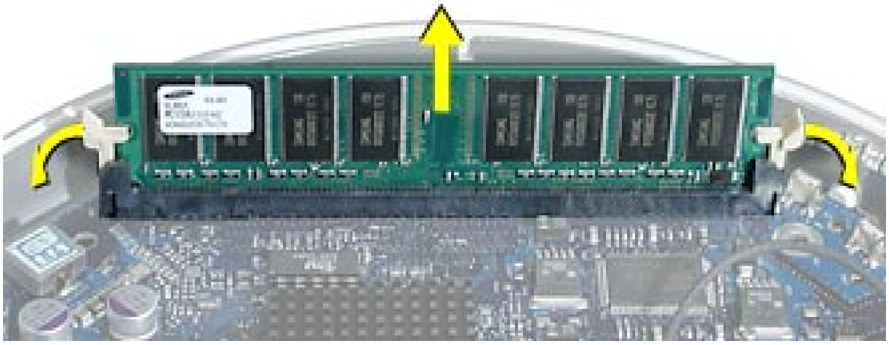
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.

Procedure

1. Push down on the ejector tabs to release the memory module.
2. Pull the memory up and out of the slot.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1. You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2.You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

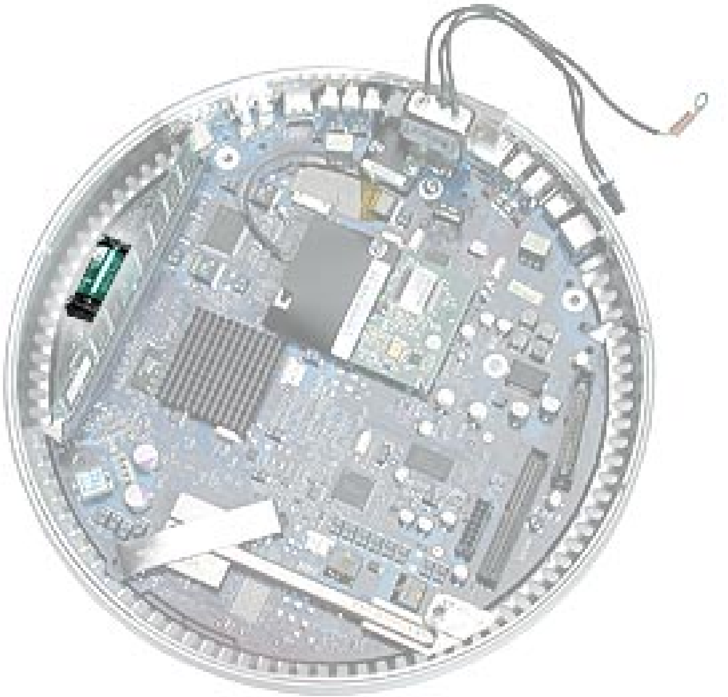
Battery

Tools

This procedure requires the following tools:

- No tools are required

Part Location



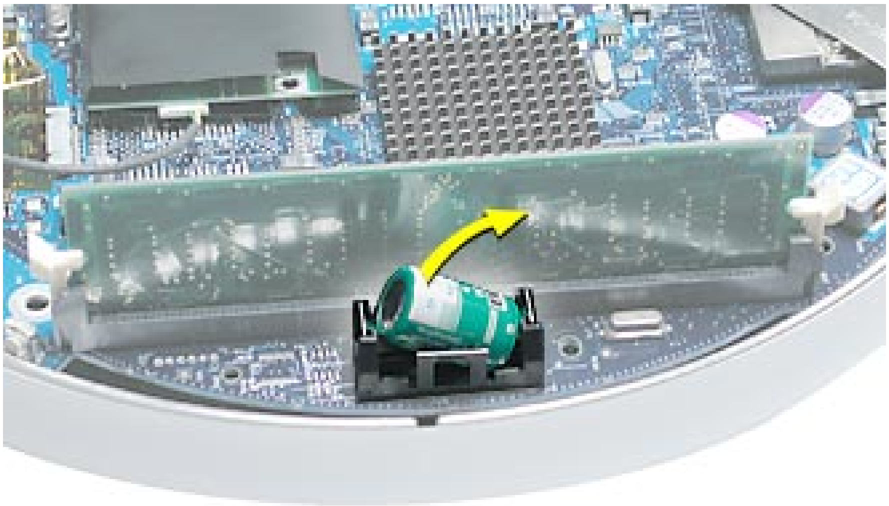
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.

Procedure

1. Using a flatblade screwdriver, gently pry the battery from the battery holder.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1. You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2.You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

Logic Board

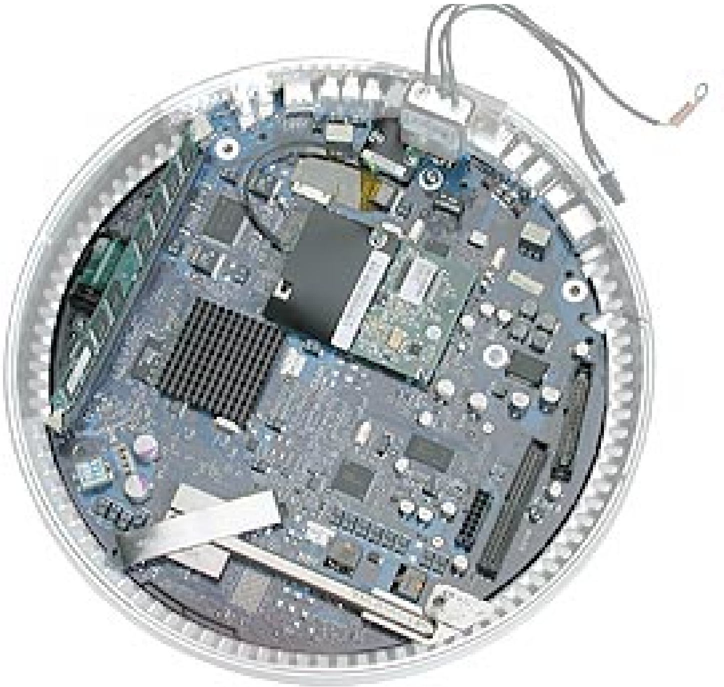
Tools

This procedure requires the following tools:

- Phillips #2 screwdriver (for the plastic screw)
- Torx-15 screwdriver

Part Location

Note: The battery, RJ-11 board, AirPort card, modem, I/O port covers, and memory (on the top and the bottom of the logic board) need to be removed from the logic board before returning the board to Apple for service.



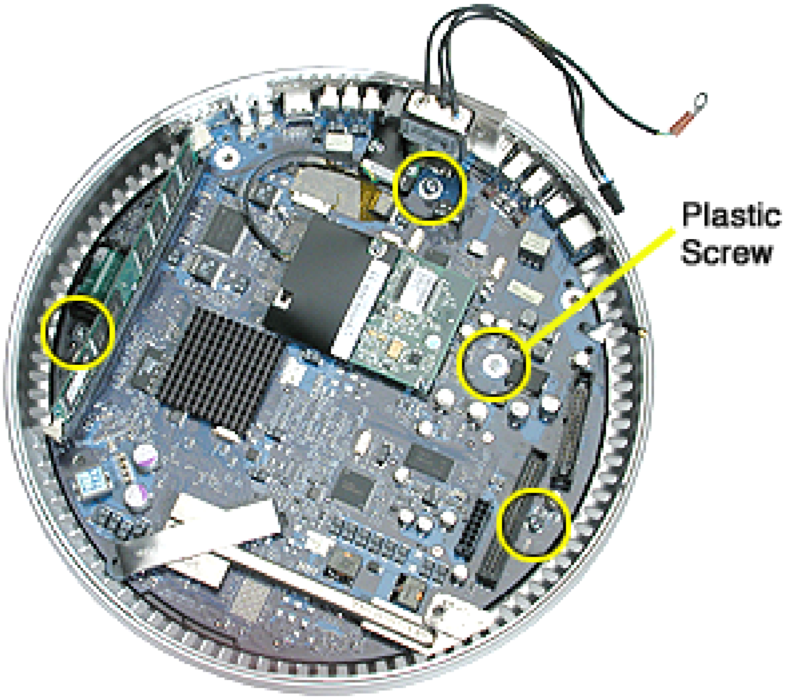
Preliminary Steps

Before you begin, do the following:

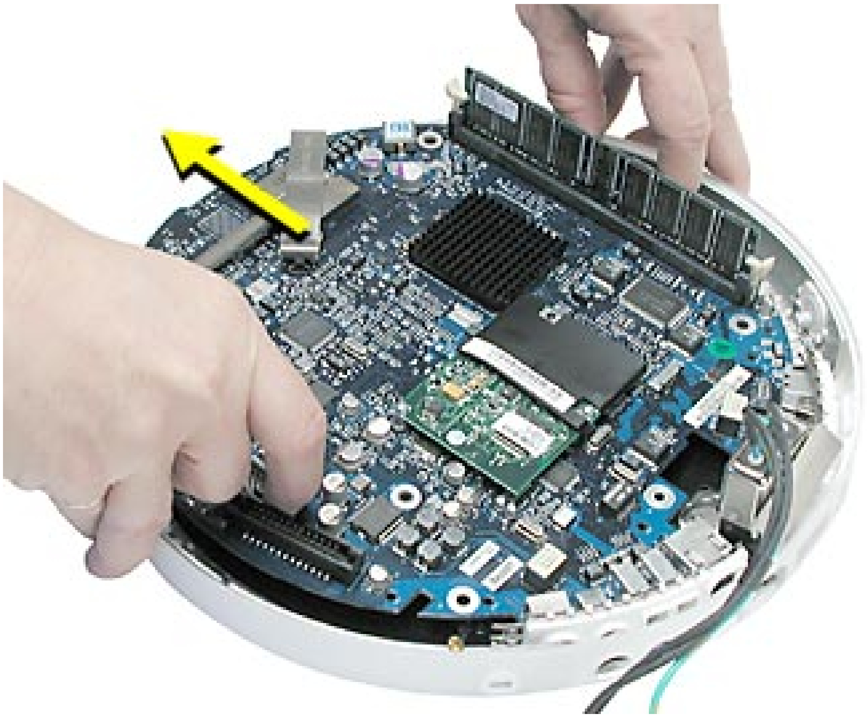
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the RJ-11 board.

Procedure

1. Remove the three metal torx screws and the one plastic screw.


Plastic
Screw

2. Grab the logic board by the battery retainer and the hard drive connector. Lift the board and pull back to release the board from the bottom housing and I/O ports. **Note:** The I/O port covers may come out with the logic board when it's removed.



3. Remove the I/O port covers from the logic board.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, "Thermal Paste Application" for detailed information.

Warning: Whenever the logic board is separated from the bottom housing, you must install new thermal pads to three surfaces on the bottom housing. The thermal pads help cool components on the logic board. Failure to apply these pads whenever the logic board is separated from the bottom housing could cause these parts to overheat. Short term separation, where the thermal pads are not handled excessively (an exception would be if you are simply testing the logic board and only detach it for a few minutes), does not require replacement. Refer to “Thermal Pad Installation” in this chapter for detailed information.

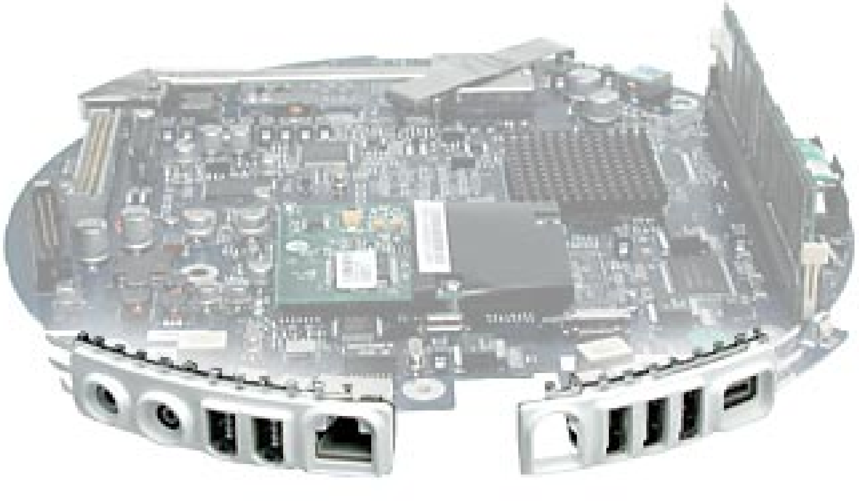
I/O Port Covers

Tools

This procedure requires the following tools:

- No tools are required

Part Location



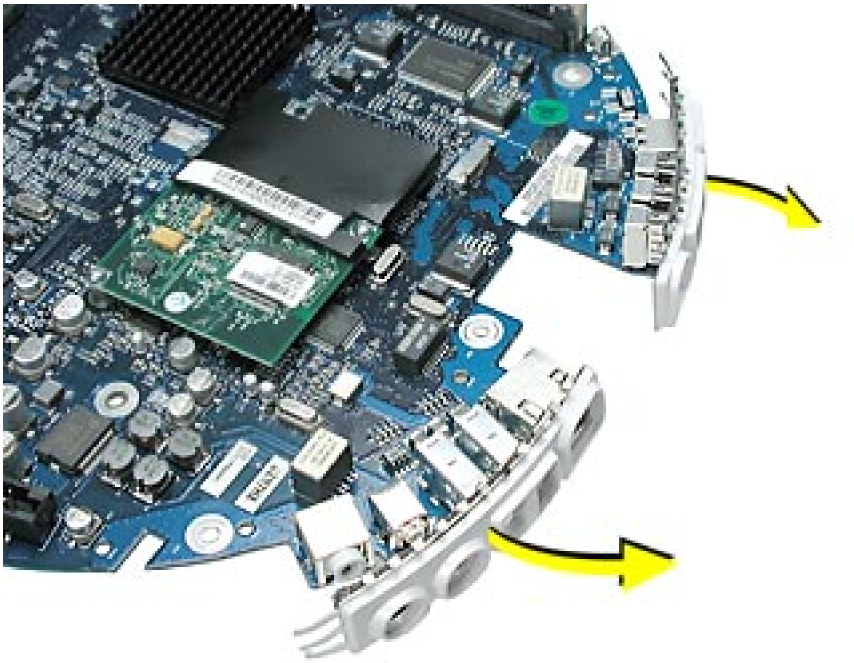
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the RJ-11 board
- Remove the logic board.

Procedure

1. Gently remove the I/O port covers from the logic board.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

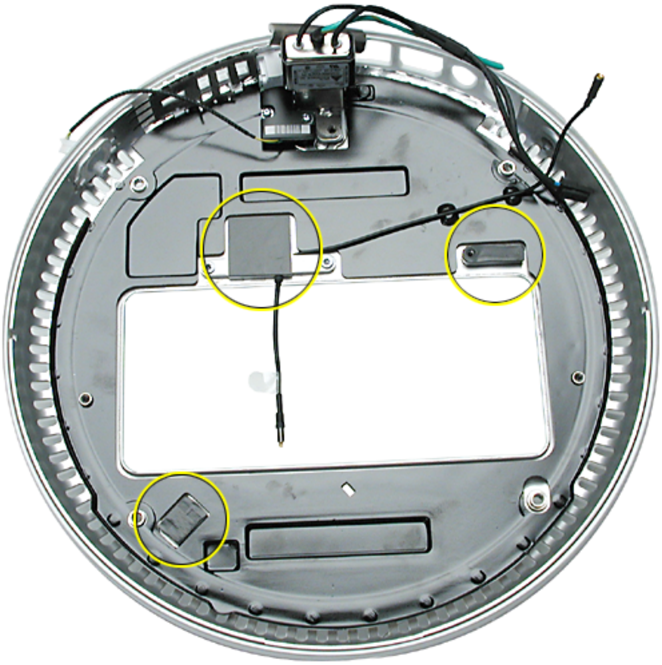
Refer to the topic, “Thermal Paste Application” for detailed information.

Thermal Pad Installation

Tools

- No tools are required.
- Thermal pad kit

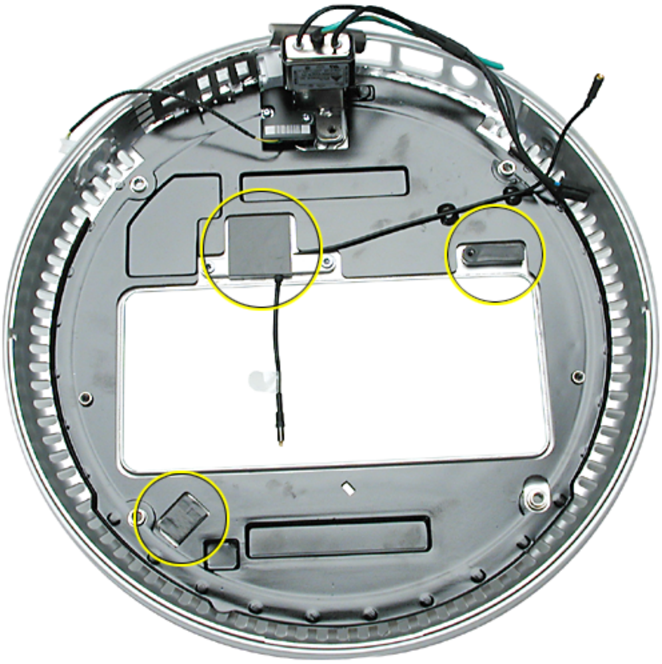
Part Location



Warning: Whenever the logic board is removed, you must install new thermal pads to three surfaces (shown above). Failure to apply these pads could cause the computer to overheat and possibly damage the internal components. **Note:** An exception would be if you are simply testing the logic board and only detach it for a few minutes.

Procedure

1. Remove the old thermal pads (shown below) from the bottom housing. **Note:** If you don’t see all three thermal pads on the bottom housing, check the bottom side of the logic board. The thermal pads may stick to the logic board. Either way, remove the old thermal pads.



2. Using the thermal pad kit, remove the clear protective backing from the new thermal pads.
3. Place the new thermal pads on the bottom housing. Press down on the blue protective backing to make sure the thermal pad has even contact with the bottom housing. There should be no air pockets.
4. Remove the blue protective backing from the new thermal pad. **Note:** Avoid unnecessary contact with either side of the thermal pad as dirt and body oils reduce the thermal pad's conductivity.
5. Holding the logic board by the battery retainer and the internal drive cable connector, slide the logic board back into the bottom housing (make sure the I/O port covers are on the logic board). **Important:** Do not push on the heatsink for leverage, as you could knock it off the chip.

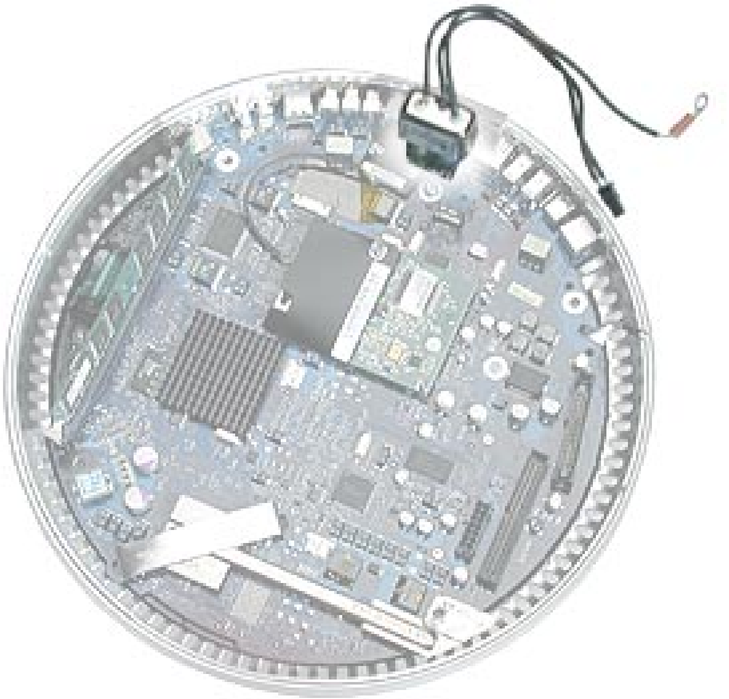
AC Line Filter

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



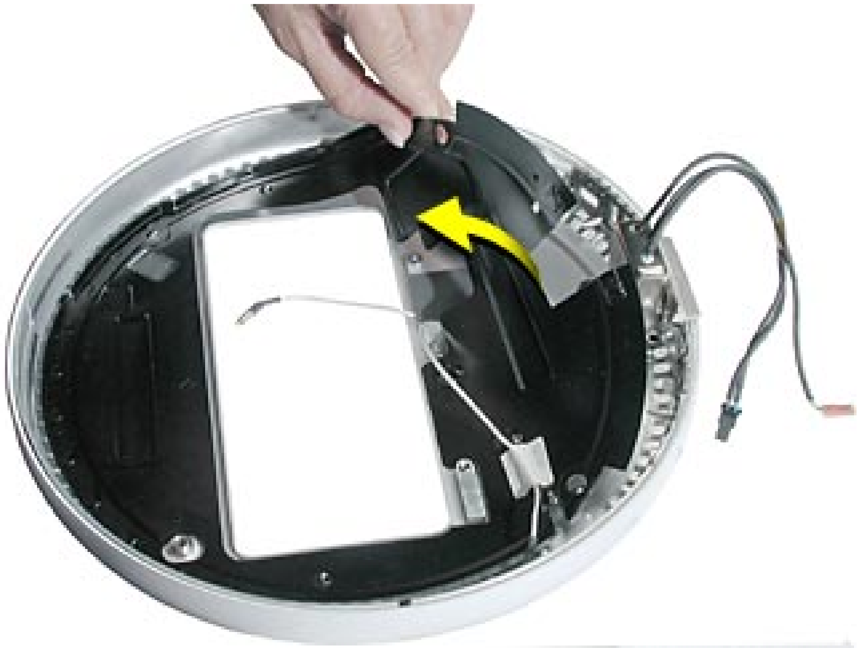
Preliminary Steps

Before you begin, do the following:

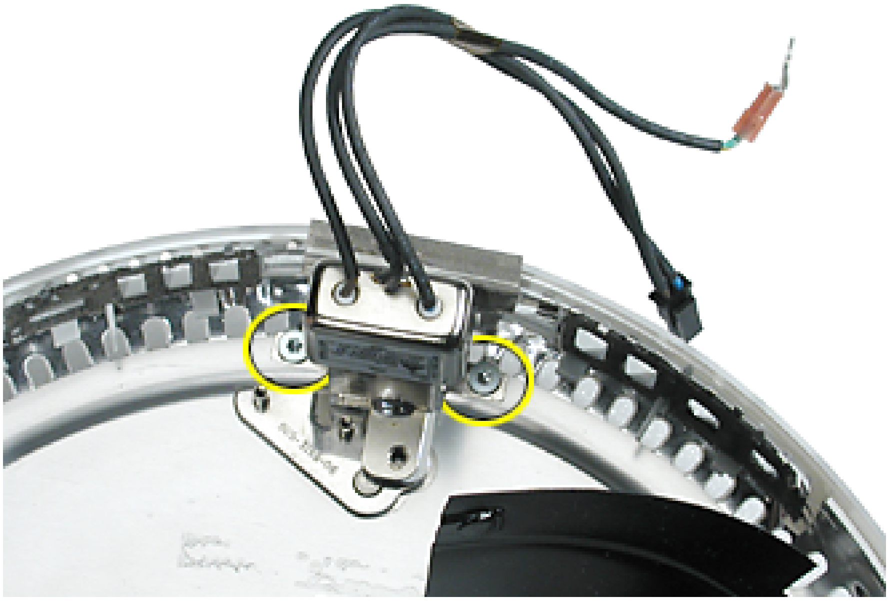
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the RJ-11 board.
- Remove the logic board.

Procedure

1. Peel back the black insulator on the bottom housing to access the AC line filter screws.



2. Remove two screws and lift the AC line filter from the bottom housing. **Note:** The AC line port cover plug may fall out of the bottom housing when you remove the AC line filter. Place the plug back into the bottom housing before reinstalling the AC line filter.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

Warning: Whenever the logic board is separated from the bottom housing, you must install new thermal pads to three surfaces on the bottom housing. The thermal pads help cool components on the logic board. Failure to apply these pads whenever the logic board is separated from the bottom housing could cause these parts to overheat. Short term separation, where the thermal pads are not handled excessively (an exception would be if you are simply testing the logic board and only detach it for a few minutes), does not require replacement.

Refer to “Thermal Pad Installation” in this chapter for detailed information.

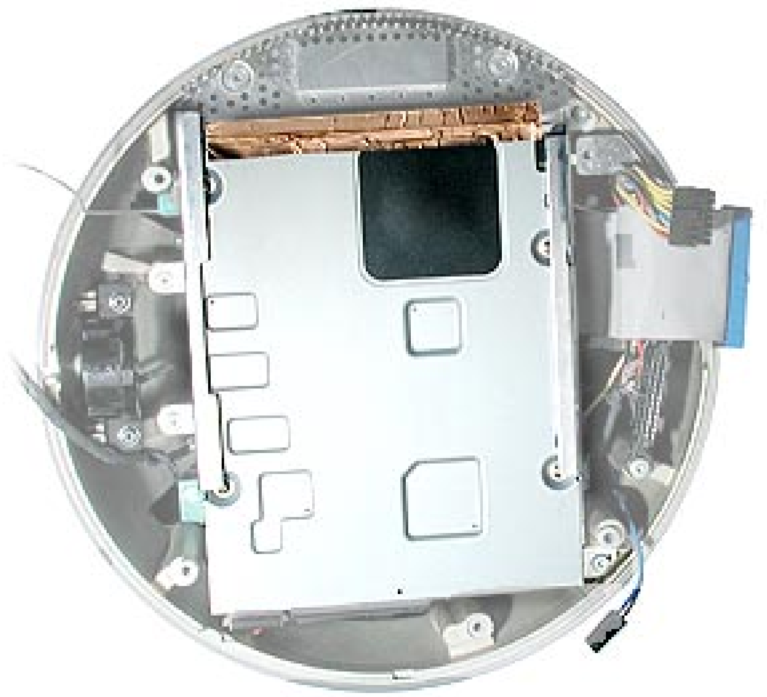
Drive Carrier Assembly (Optical and Hard Drive)

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



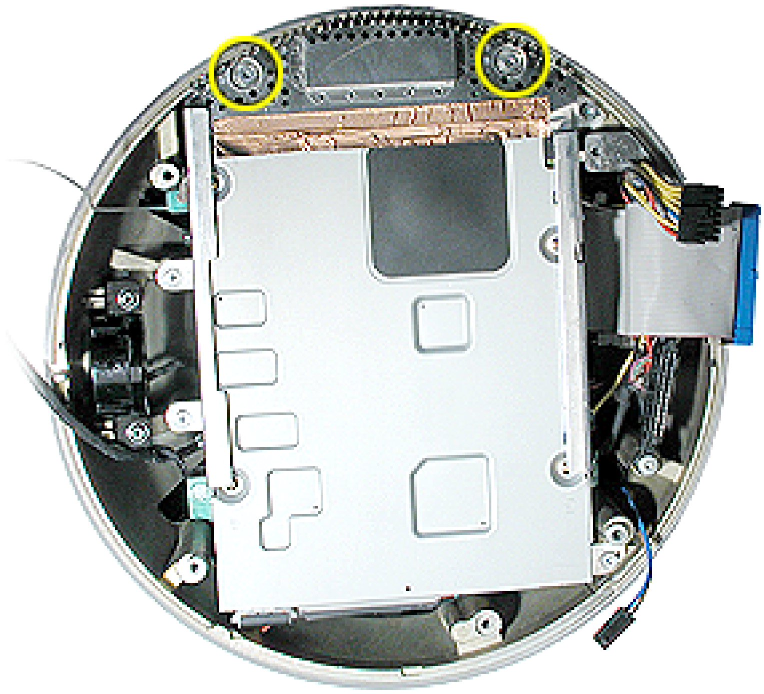
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand with the door facing up.
- Remove the user access plate.
- Remove the bottom housing.

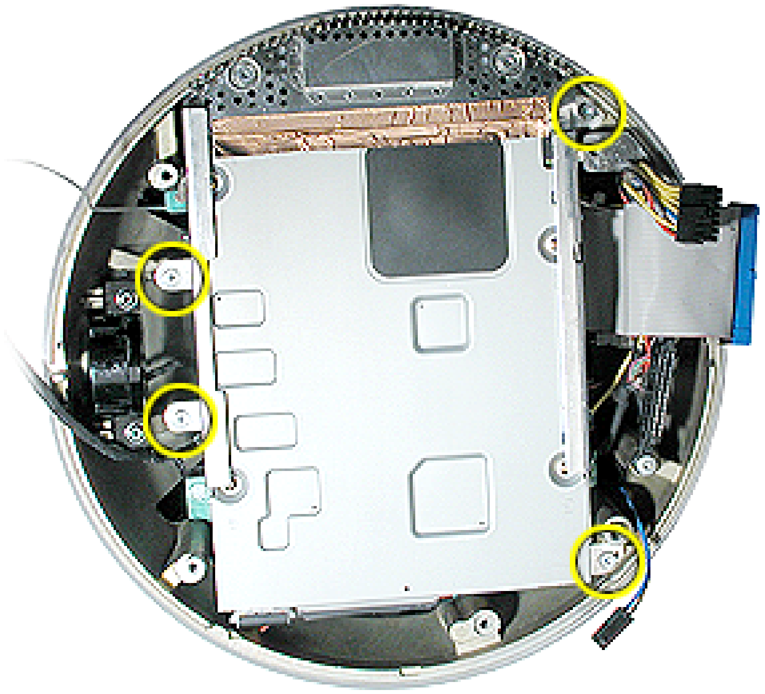
Procedure

1. Rotate the base unit so the optical drive door is facing up (as shown below).
2. Remove two screws on the EMI shield. Carefully lift the shield and peel the copper tape off the drive.

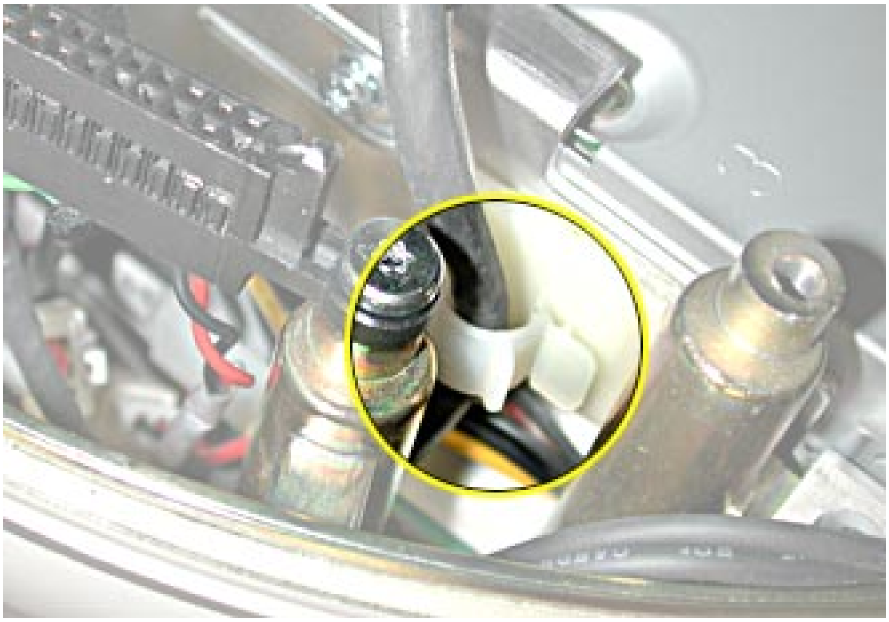


3. **Note:** The copper tape is stuck to the EMI shield and the optical drive. Carefully peel the copper tape off the drive to remove the EMI shield.
4. Remove four screws attaching the drive carrier to the metal chassis (also known as

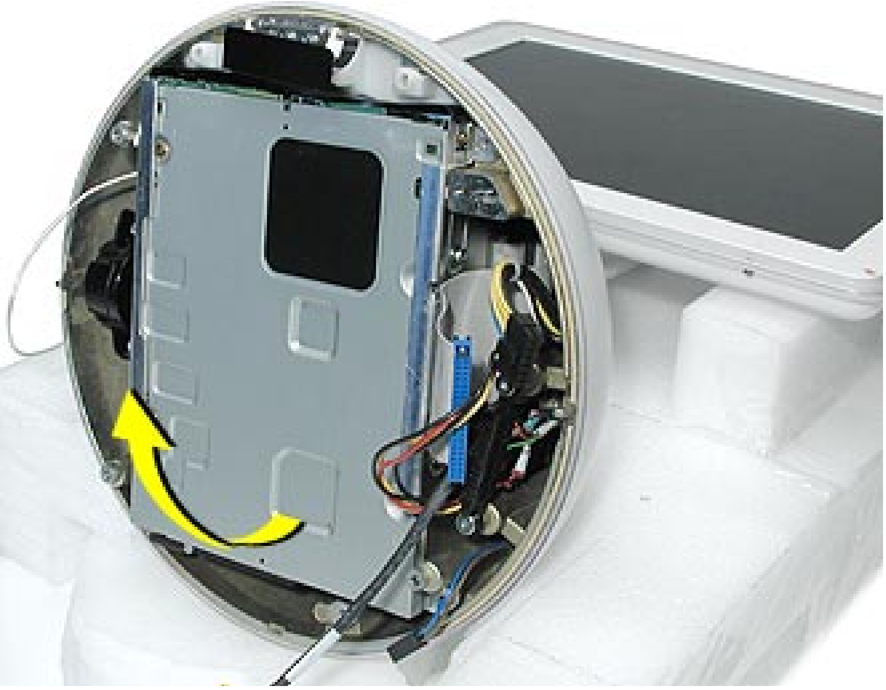
the Faraday cage).



5. Remove the Airport antenna and the video cable from the plastic clip on the side of the hard drive.

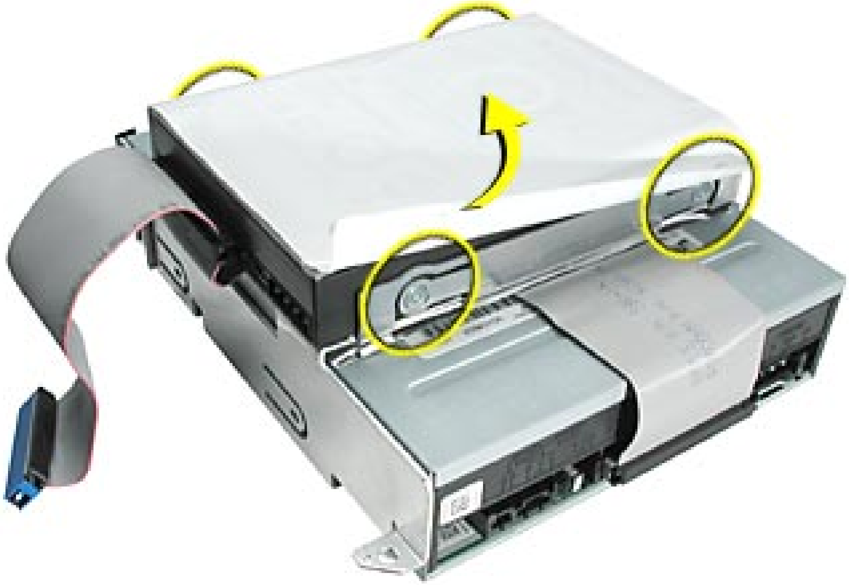


6. Grasp the carrier on both sides. Lift and pull the carrier in the direction of the arrow. Once the carrier is out, flip the carrier to the right to disconnect the power cables. **Note:** The carrier fits snugly into the chassis.



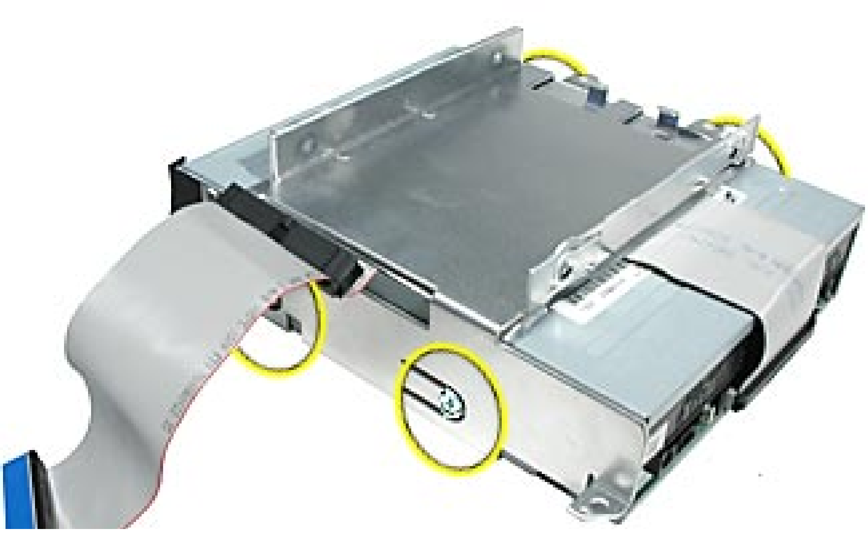
7. Disconnect the data cables.

8. Peel the white wrapper up to access the screws connecting the hard drive to the carrier.

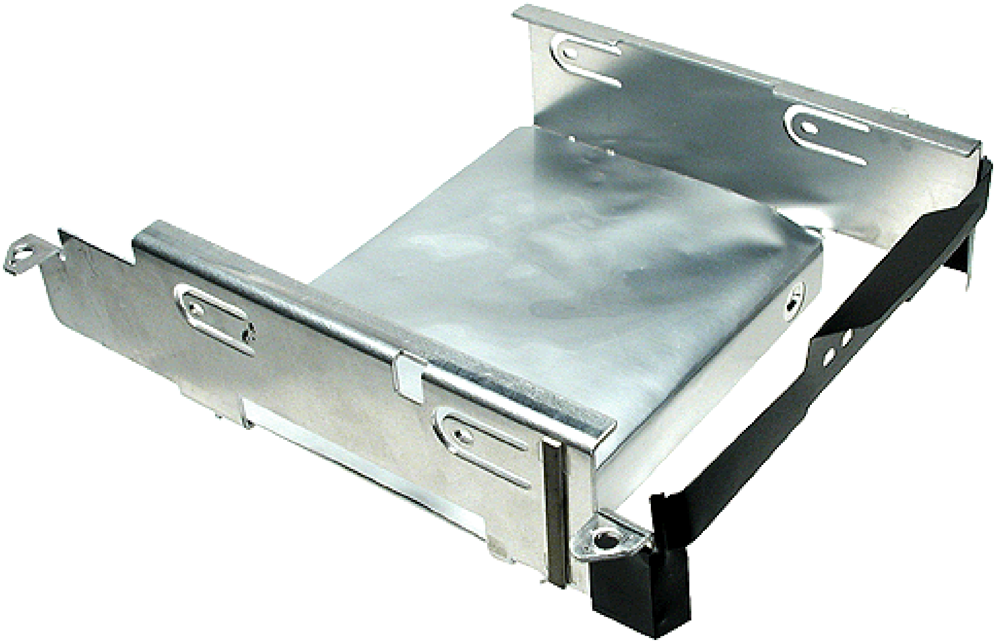


9. Remove the hard drive from the carrier.

10. Remove four screws (shown by circles) to remove the optical drive from the carrier.



11. Slide the optical drive out of the carrier. Be careful of the black plastic dust filter on the carrier. It is very fragile and can rip easily if not handled properly. **Note:** The silver insulator is part of the carrier assembly.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

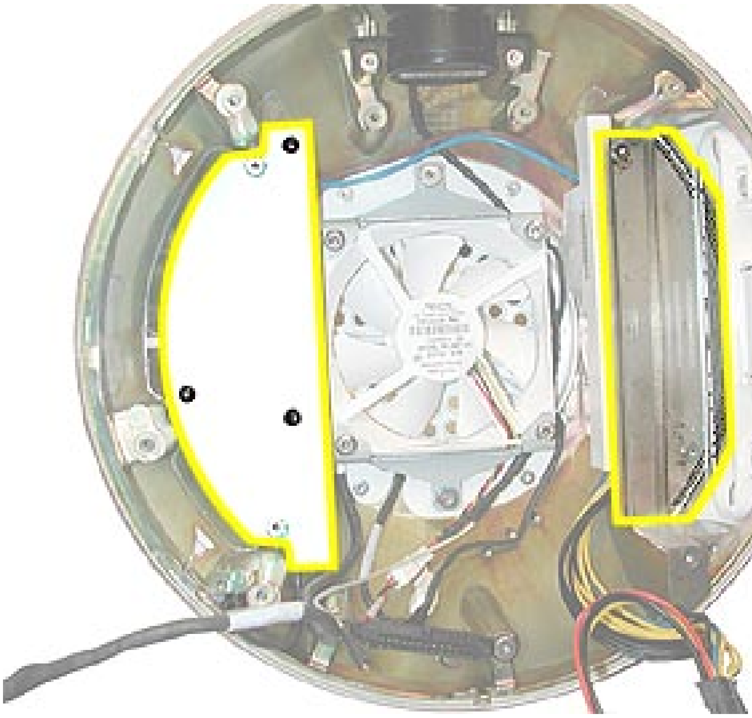
Power Supply

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



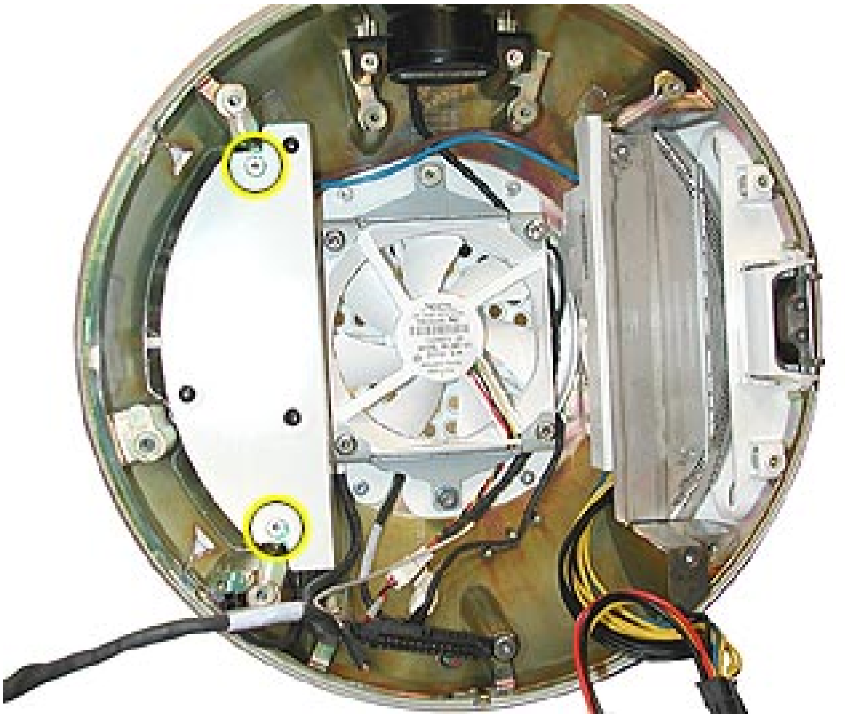
Preliminary Steps

Before you begin, do the following:

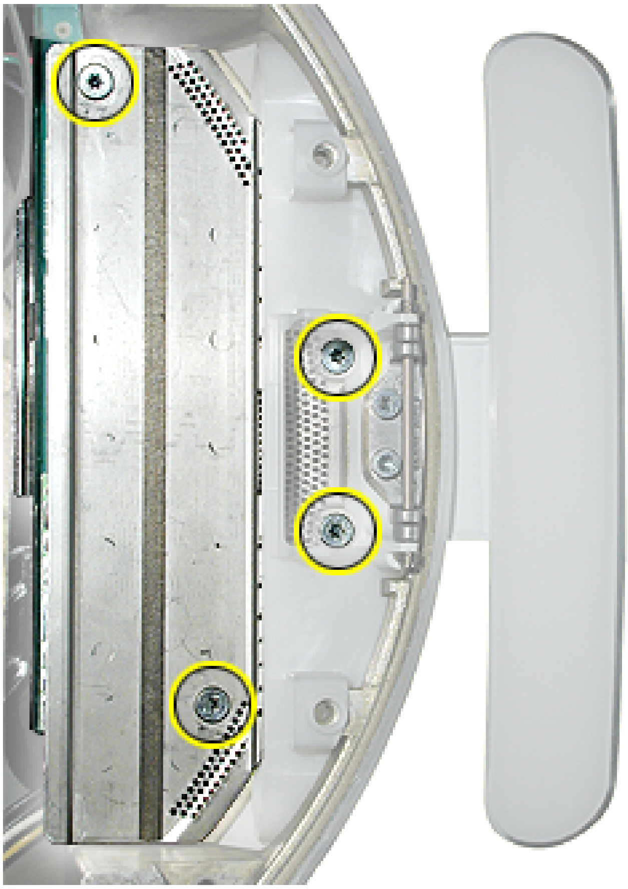
- Position the computer in the service stand and rotate the door to the right.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.

Procedure

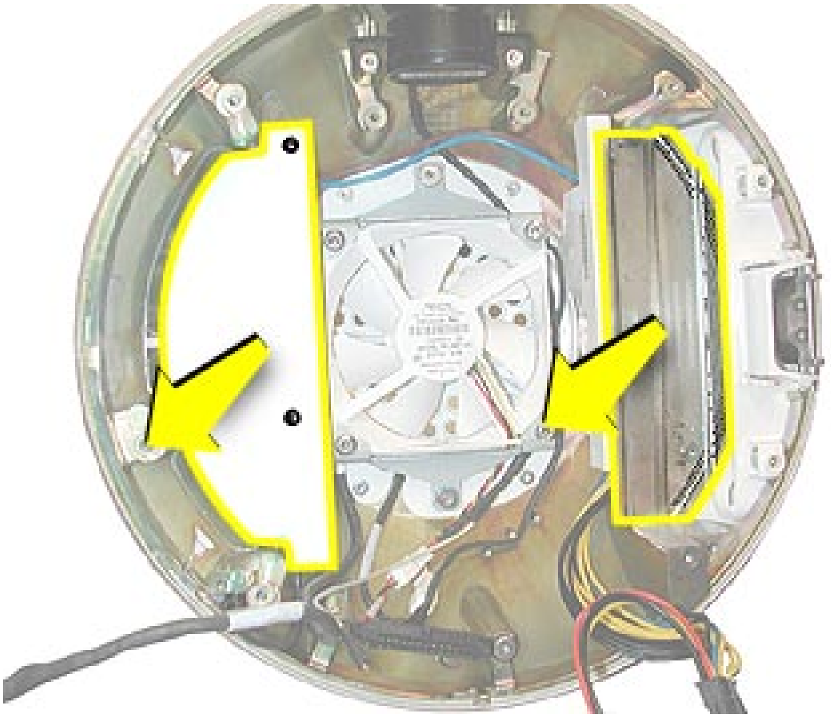
1. Remove the two power supply screws circled below.



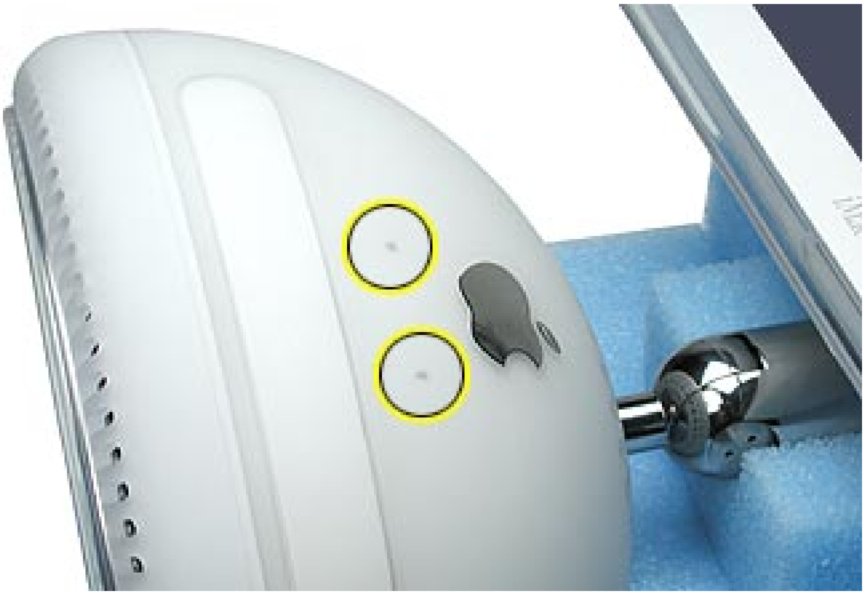
2. Open the optical drive door as shown. Support the metal plate and power supply as you remove the four screws.
   Important: The two screws near the door hinge are shorter than the other power supply screws. Failure to replace the shorter screws into their correct location will scratch the top housing. See step 4, Replacement Note.



3. Remove the power supply from the chassis (Faraday cage).



4. **Replacement Note:** When replacing the metal plate (see picture above) that sits on top of the power supply , make certain that the two shorter screws are inserted into the screw holes near the optical door. If the longer screws are inserted by mistake, the screws will scratch the top housing (circled below).



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

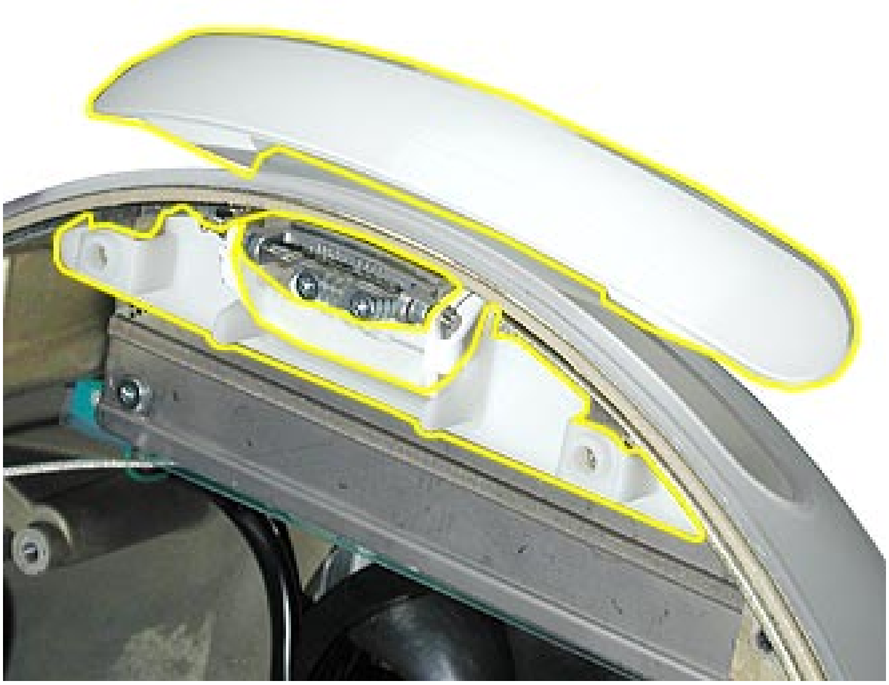
Optical Drive Door

Tools

This procedure requires the following tools:

- Torx-10 screwdriver
- Needlenose pliers

Part Location



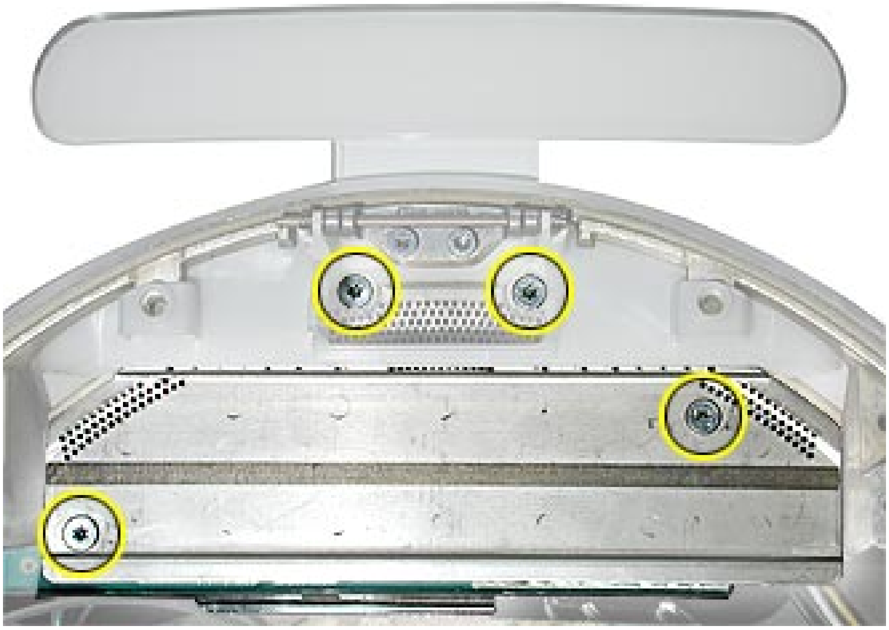
Preliminary Steps

Before you begin, do the following:

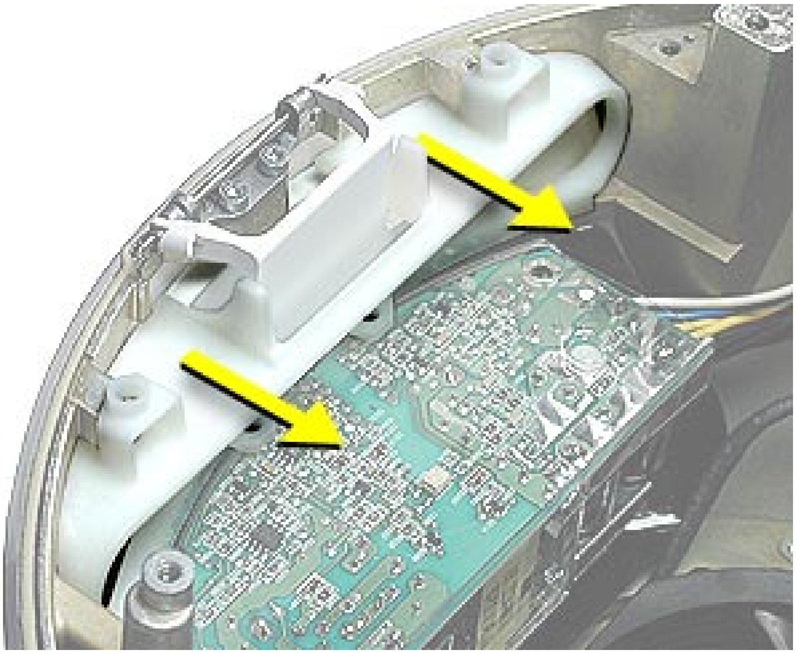
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.

Procedure

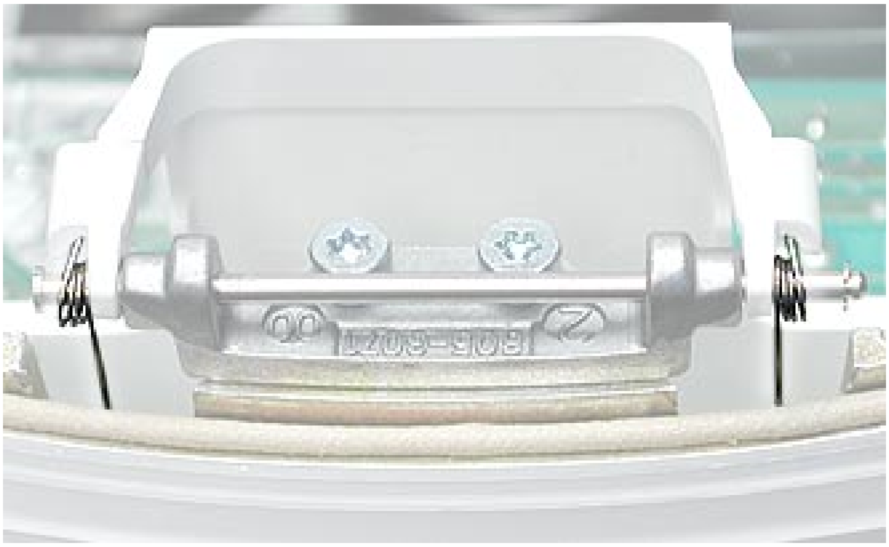
1. Remove the four screws on the power supply metal shield. Set the shield aside. **Important:** The two screws near the door hinge are shorter than the other power supply screws. Failure to replace the shorter screws to their correct location will scratch the top housing. See step 4, Replacement Note in the Power Supply section for a picture .



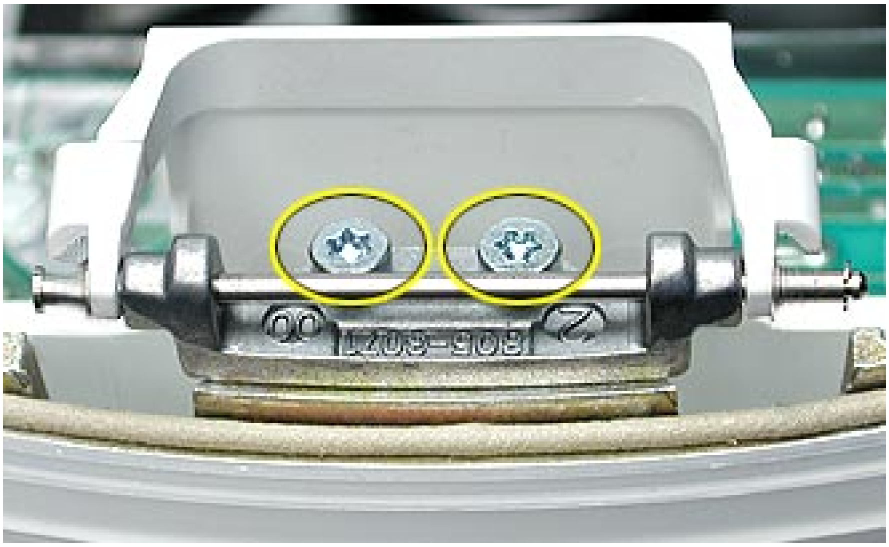
2. Slide the plastic door frame off the chassis.



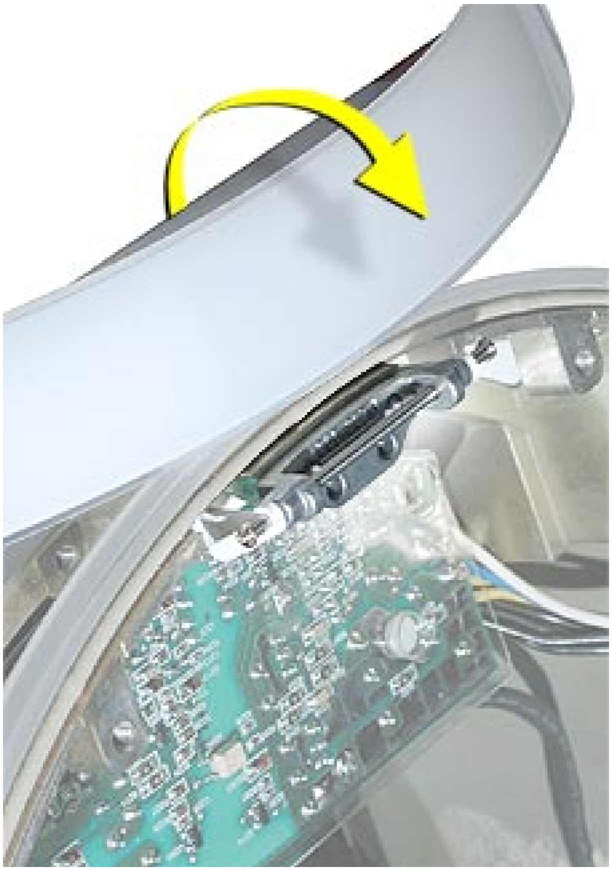
3. Carefully remove the two door springs with a needlenose pliers.



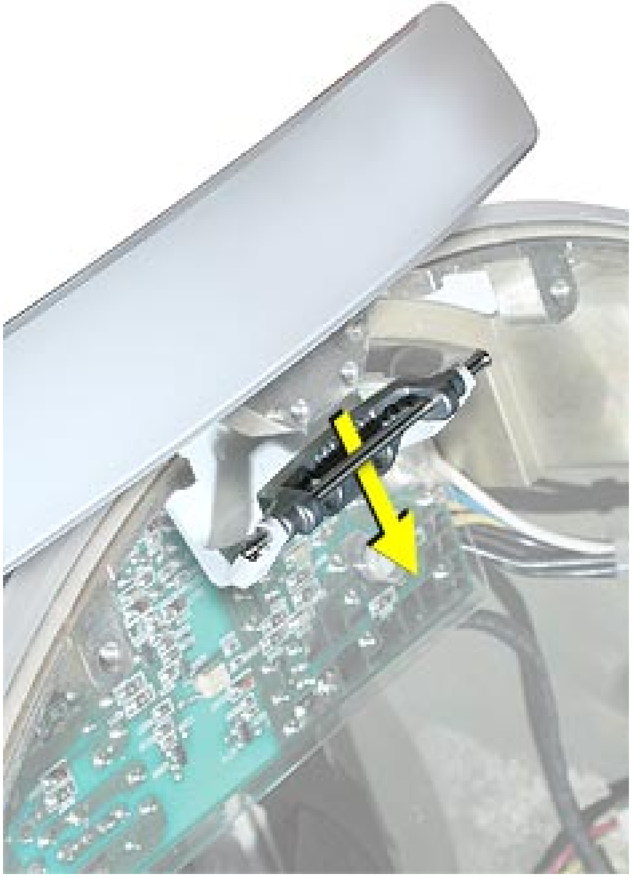
4. Remove the door hinge screws.



5. Open the door open.



6. Slide the door and hinge off the frame. Remove the door from the base.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

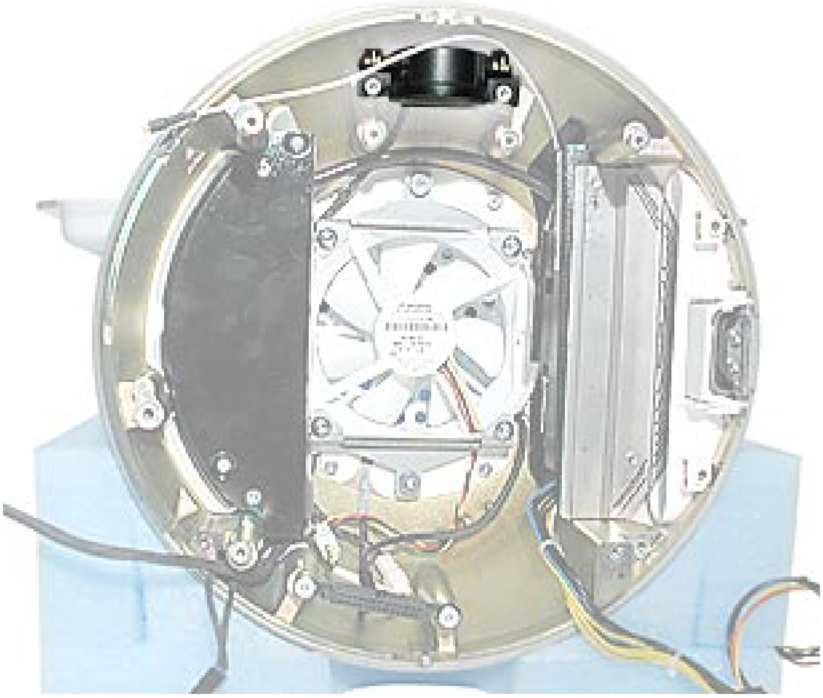
Speaker, Internal

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



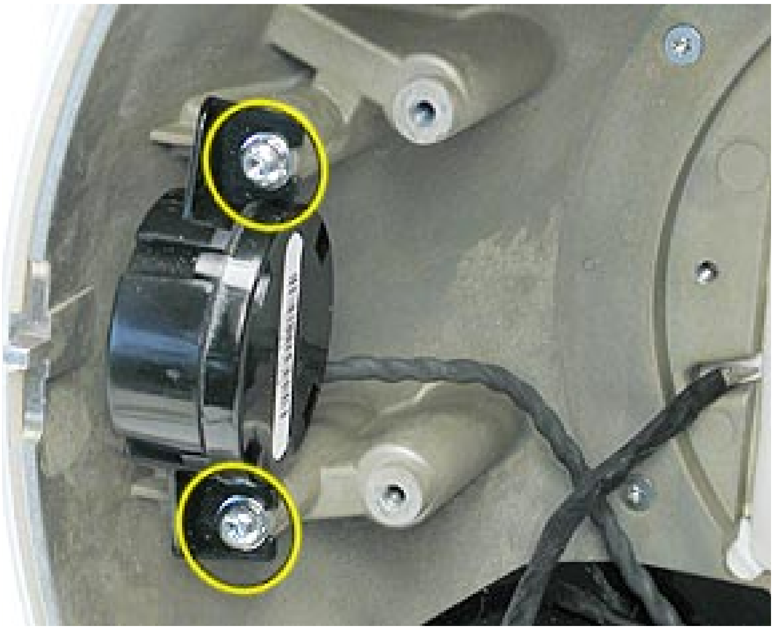
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.

Procedure

1. Loosen the two screws enough to slide the speaker off the metal posts. Disconnect the speaker cable.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

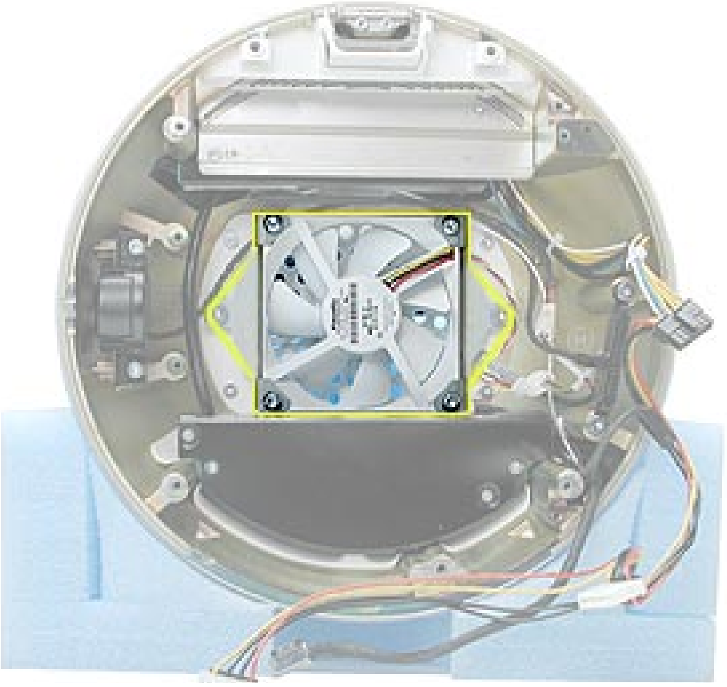
Fan

Tools

This procedure requires the following tools:

- Torx-15 screwdriver

Part Location



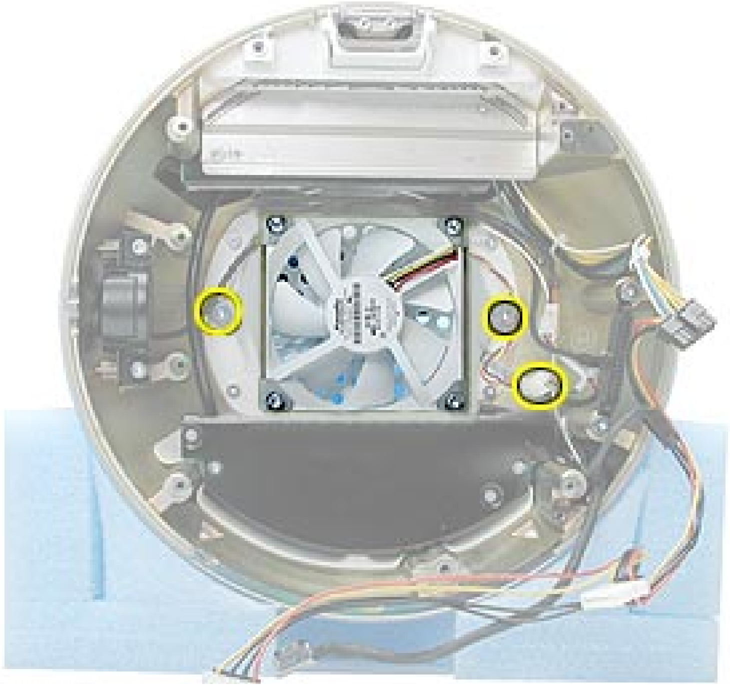
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.

Procedure

1. Remove the two fan screws and disconnect the fan connector.
2. Lift the fan out of the chassis (Faraday cage).



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

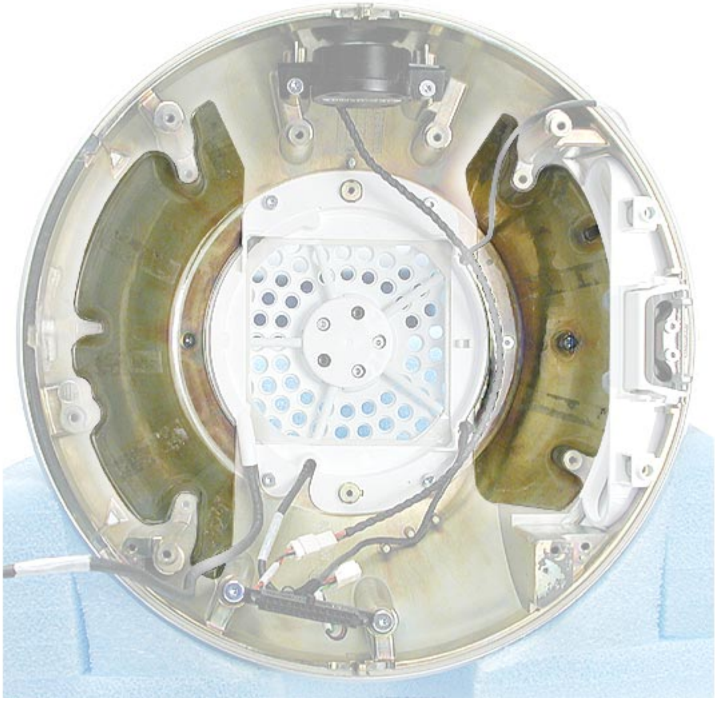
Refer to the topic, “Thermal Paste Application” for detailed information.

Power Supply Insulators

Tools

No tools are required for this procedure.

Part Location



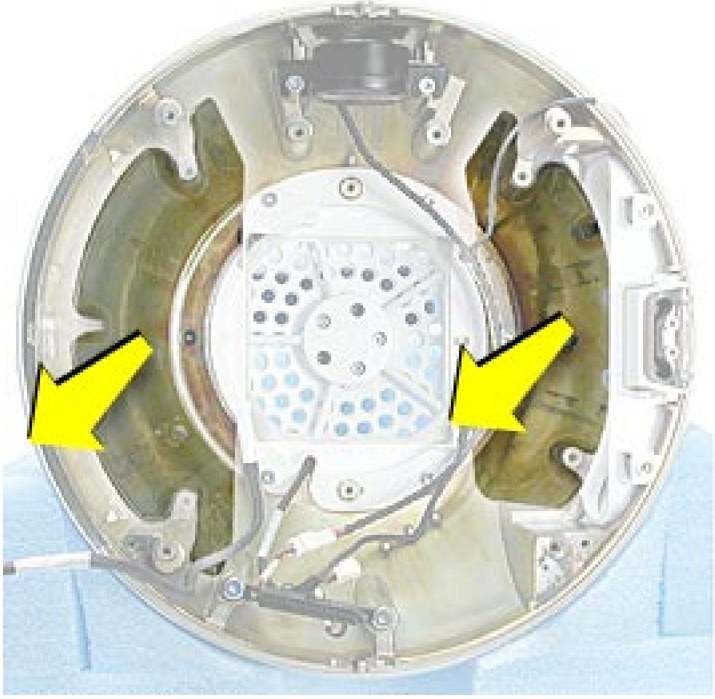
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.

Procedure

1. Carefully pull the insulators from the chassis (Faraday cage). These are attached to the chassis with double-sided tape.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

Neck Cable Retainer (under fan)

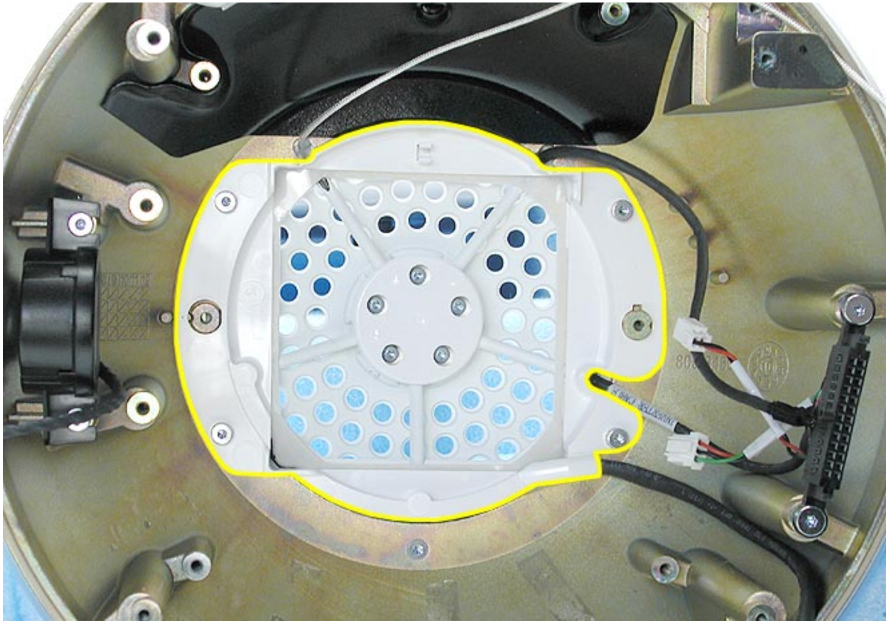
Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location

Note: View the document at a larger size to enlarge this graphic.



Preliminary Steps

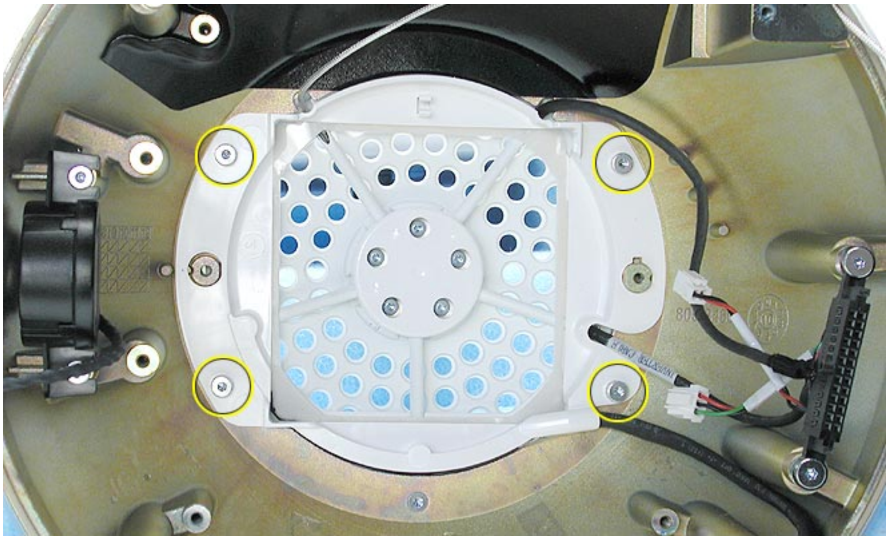
Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the fan.

Procedure

1. Remove the four screws connecting the plastic cable retainer to the chassis (Faraday cage).

Note: View the document at a larger size to enlarge this graphic.



2. Lift the plastic cable retainer from the chassis. **Note:** The fan gasket is stuck to the back side of the plastic cable retainer.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

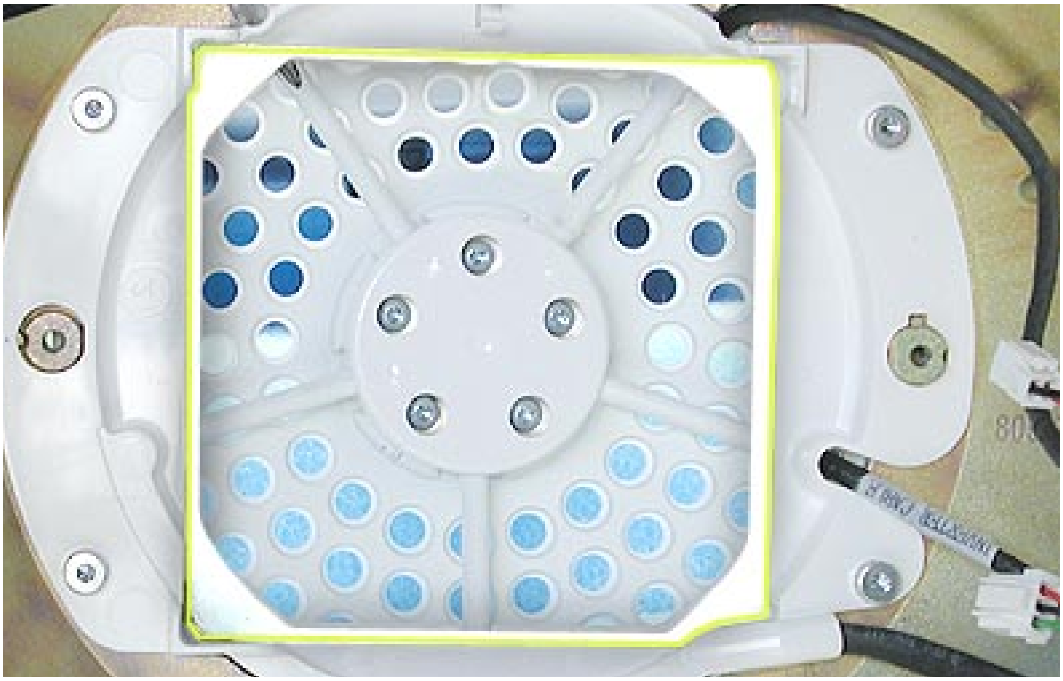
Refer to the topic, “Thermal Paste Application” for detailed information.

Fan Gasket

Tools

No tools are required for this procedure.

Part Location



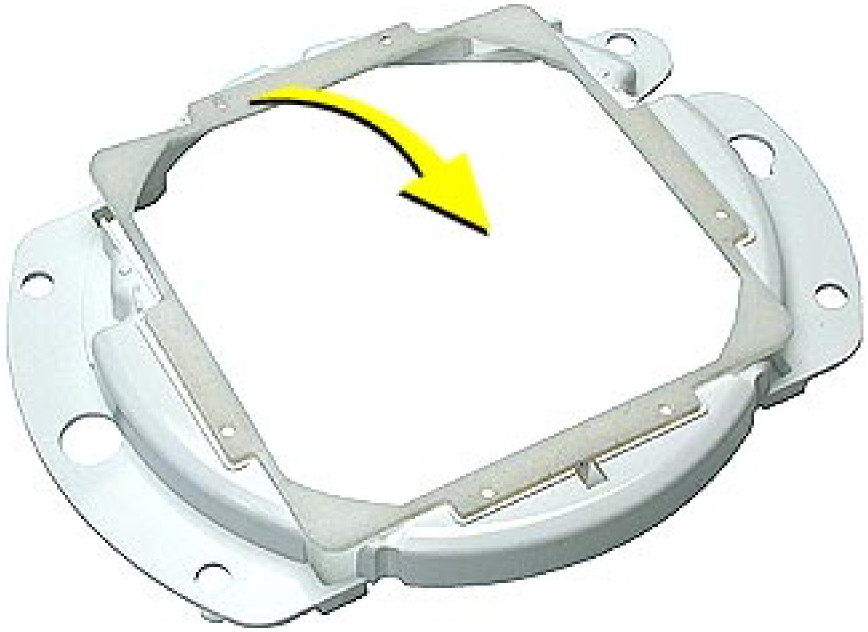
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the fan.
- Remove the plastic cable retainer.

Procedure

1. Remove the plastic cable retainer and turn it over. Gently peel the fan gasket off the back of the cable retainer.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

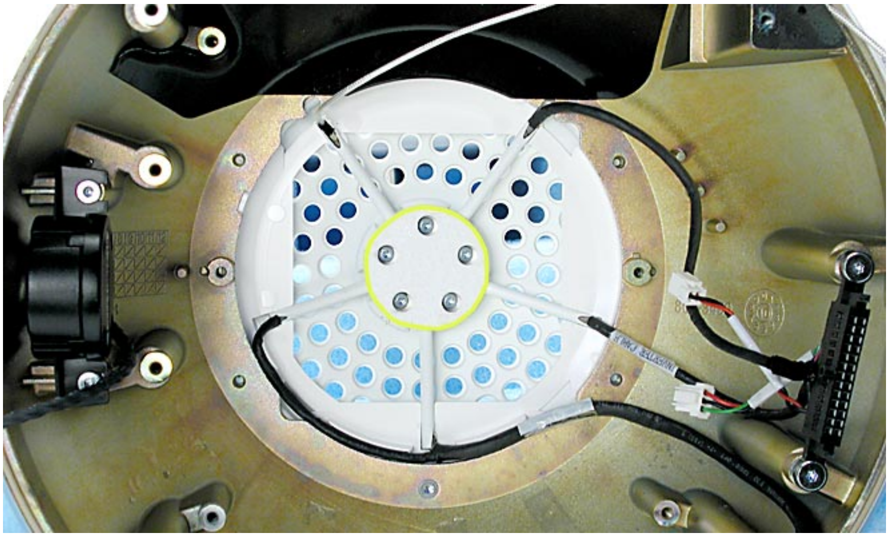
Cap, Neck Spoke Retainer

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



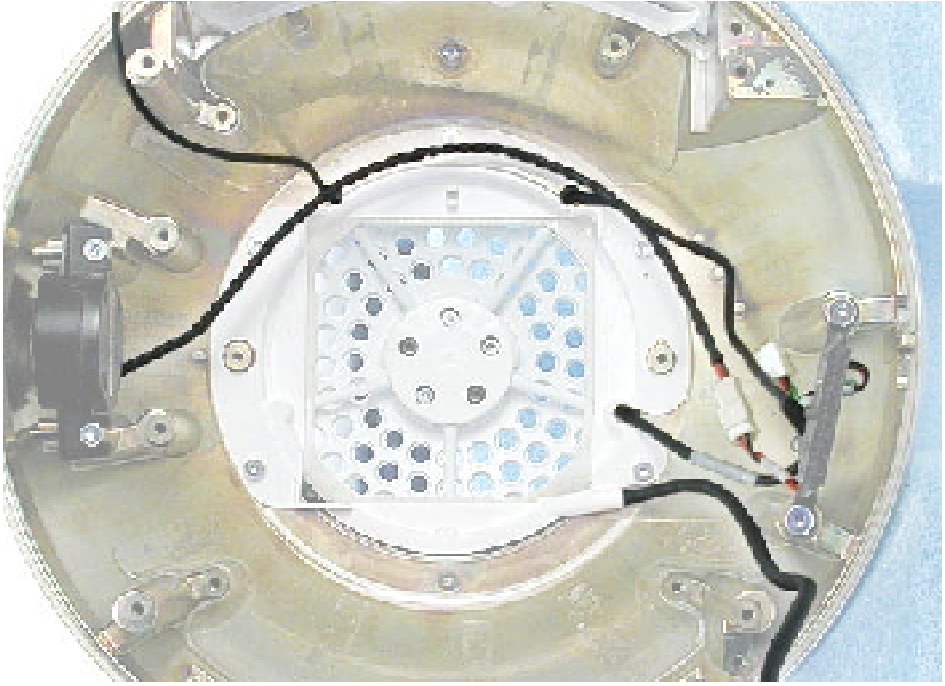
Preliminary Steps

Before you begin, do the following:

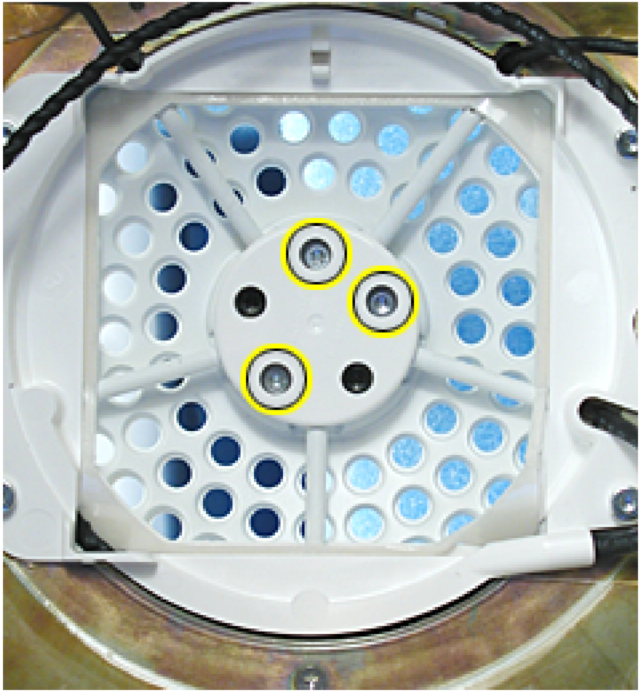
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the fan.
- Remove the plastic cable retainer.

Procedure

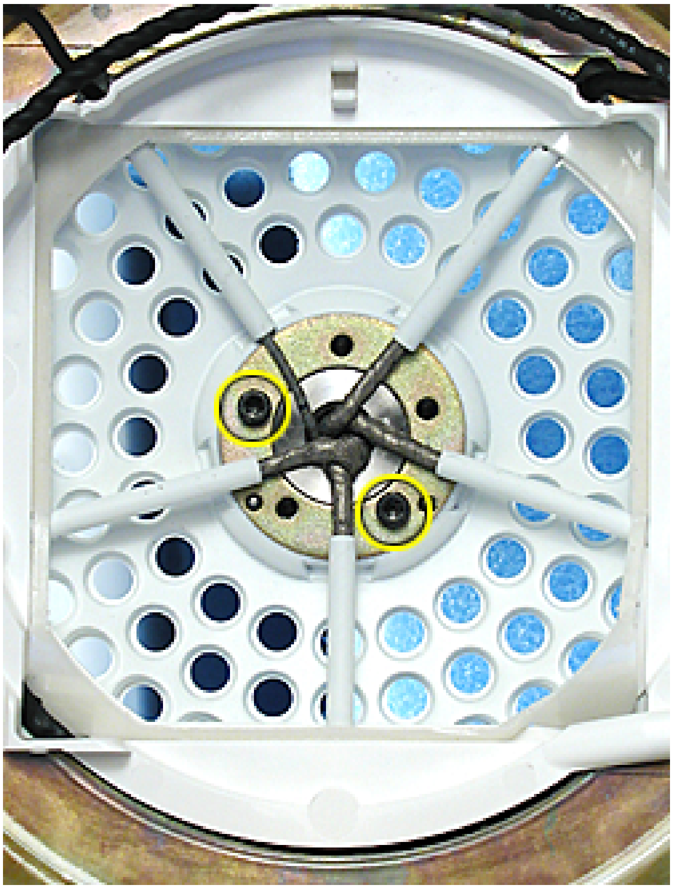
1. The neck cables are highlighted below. Note the cable routing, including the blind mate connector orientation before removing the cap screws and neck cap. **Note:** View the document at a larger size to enlarge the next two graphics.



2. There are five screws on the neck cap, however; only the three silver screws need to be removed. The remaining two black screws keep the neck attached to the base.



3. Llift the neck cap off the cables. Tthe two remaining black screws hold the neck to the base. Note the orientation for neck reassembly.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

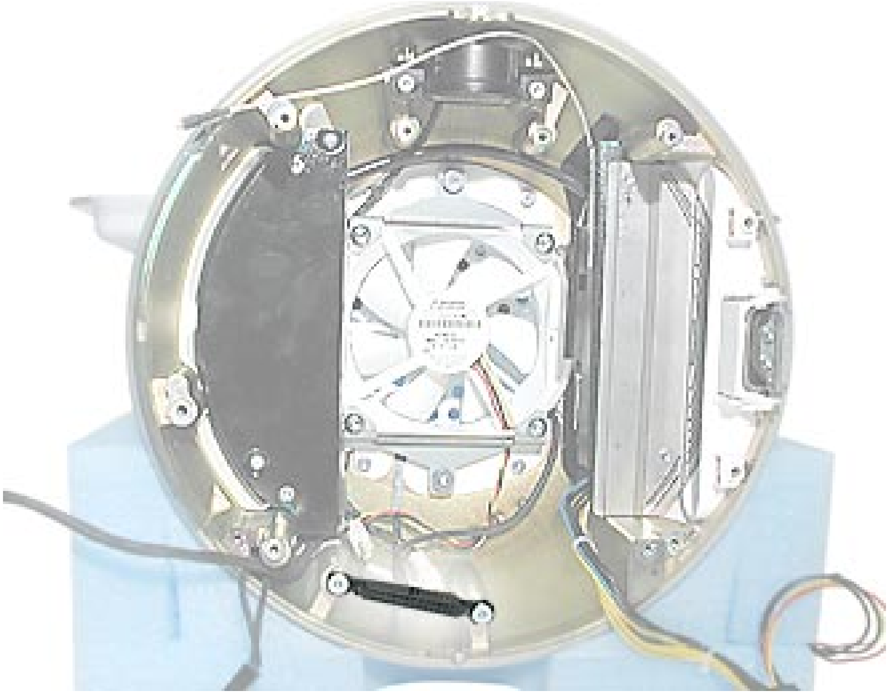
Blind Mate Connector

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



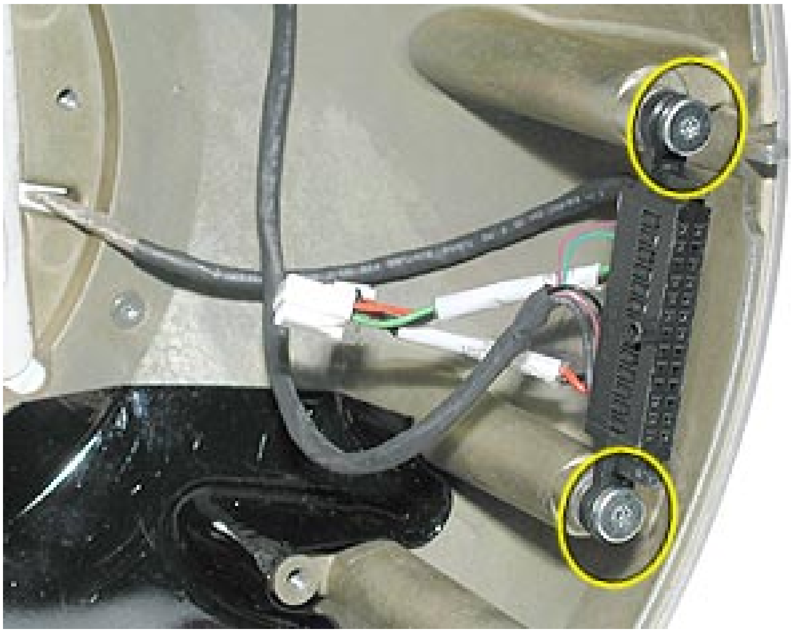
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the fan.
- Remove the plastic cable retainer.
- Remove the cap neck spoke retainer.

Procedure

1. Remove the two screws.
2. Lift the blind mate connector off the chassis. **Note:** The blind mate connector is part of the neck assembly.



Replacement Notes:

Blind Mate Connector: Make sure to replace the connector into the chassis with the tab on the blind mate connector facing inward (toward the fan). And, when tightening the screws, the blind mate connector should have some play; do not tighten down so it doesn't move at all.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, "Thermal Paste Application" for detailed information.

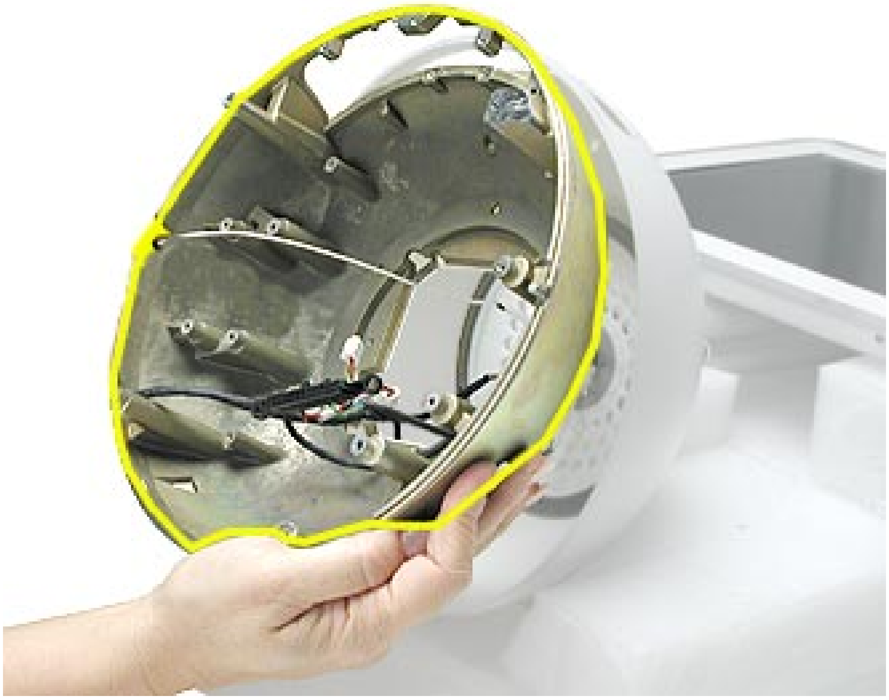
Chassis (Faraday Cage)

Tools

This procedure requires the following tools:

- Torx-10 screwdriver
- Torx-8 screwdriver for the logo screw

Part Location



Preliminary Steps

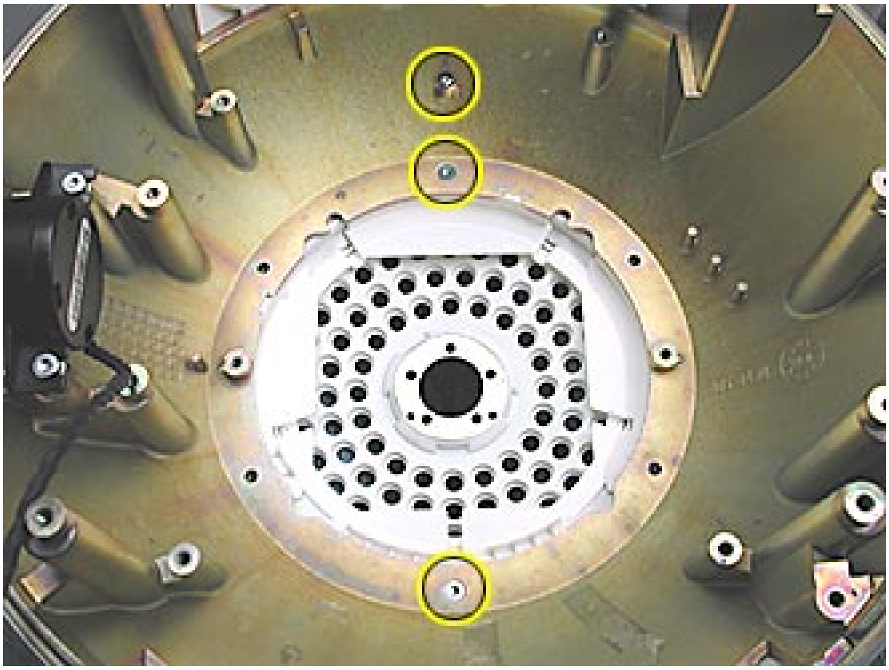
Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the power supply insulators.

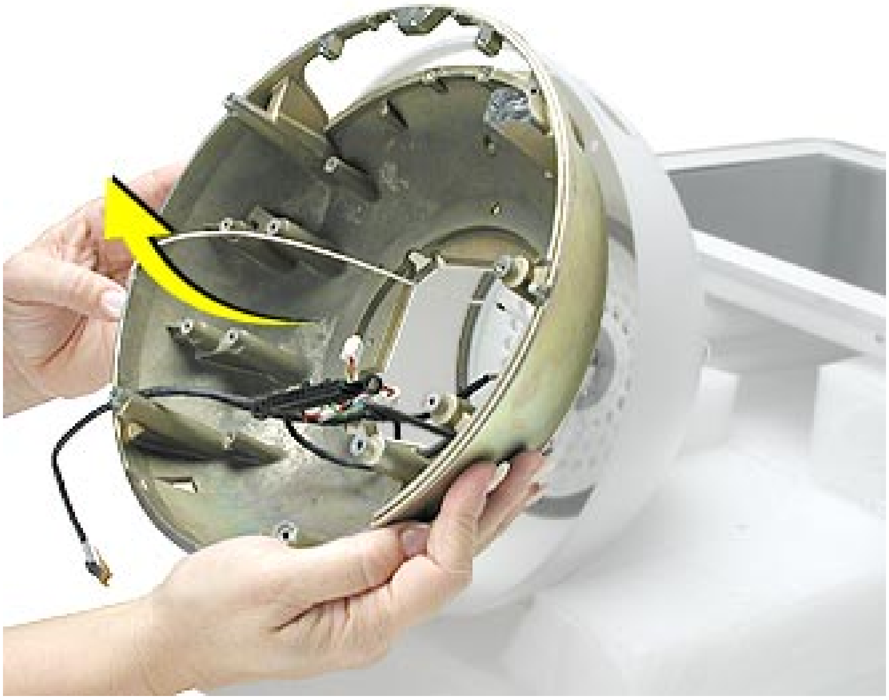
- Remove the fan.
- Remove the plastic cable retainer under the fan.
- Remove the cap neck spoke retainer.
- Remove the blind mate connector screws.
- Pull the neck cables through the neck ring.

Procedure

1. Remove the three screws in the base of the Faraday cage. The screw at the top of the picture is the logo screw (T-8), located under the insulator (which may already be removed).



2. Separate and lift the Faraday cage away from the outer housing. Be careful not to scratch the white plastic housing. **Important:** The Faraday cage is very heavy and has sharp edges; handle with care.



Replacement Notes:

Faraday cage: Look at the exploded view diagram during reassembly. First, attach the metal neck plate (the round, metal plate with holes) to the top of the Faraday cage, this is keyed. Next, install the Faraday cage into the top plastic housing, and replace the three screws holding the plastic housing to the chassis. Thread the neck cables through the hole in the metal neck plate. Attach two neck cap screws to connect the neck to the chassis. Then route the neck cables correctly in the base and replace the cap neck spoke retainer and three remaining cap screws.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

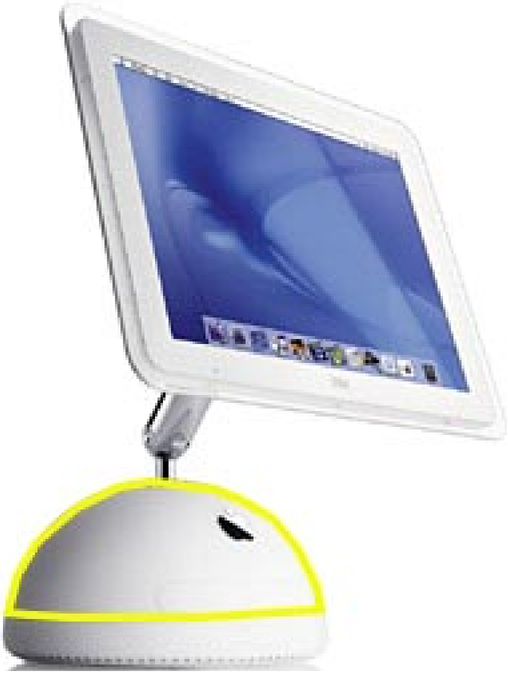
Housing, Outer Shell, Plastic

Tools

This procedure requires the following tools:

- Torx-10 screwdriver

Part Location



Preliminary Steps

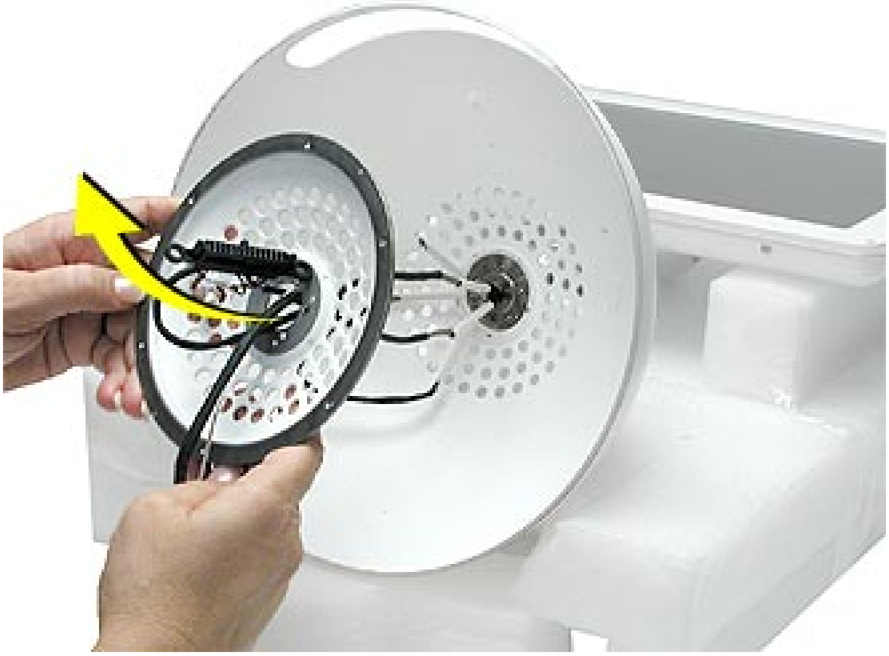
Before you begin, do the following:

- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the power supply insulators.
- Remove the fan.
- Remove the plastic neck cable retainer (under the fan).
- Remove the cap spoke holder.

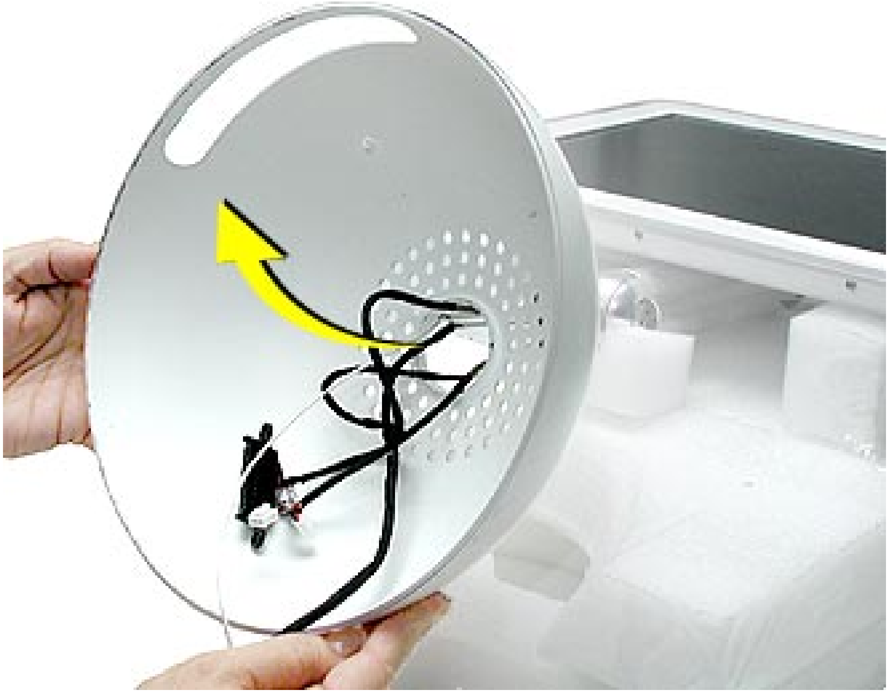
- Remove the blind mate connector screws.
- Remove the Faraday cage.

Procedure

1. Carefully, pull the neck cables through the hole on the metal neck plate shown below. Start with the blind mate connector and cables, then the long video cable, followed by the AirPort antenna. **Important:** Be careful not to scratch the white paint on the inside of the housing shell, the metal neck plate, and the neck cable spokes



2. Next, carefully pull the neck cables through the hole in the plastic housing. **Note:** Turn the blind mate connector vertically to pull it through the hole.



Warning: Whenever the bottom housing is opened for service, you must do two things:

1.You must clean the original thermal film from the surfaces joining the thermal interface layer and reapply thermal paste to the thermal pipe.

2. You must tighten the four torx screws on the bottom housing to a minimum of 17 in.-lbs. If you do not have a torque driver, you will have to make sure these screws are tightened by hand FIRMLY, BUT NOT FORCIBLY. Or, purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom housing is not securely attached to the base in this fashion, the CPU may overheat and become damaged. Failure to follow either of these steps could cause the computer to overheat and damage internal components.

Refer to the topic, “Thermal Paste Application” for detailed information.

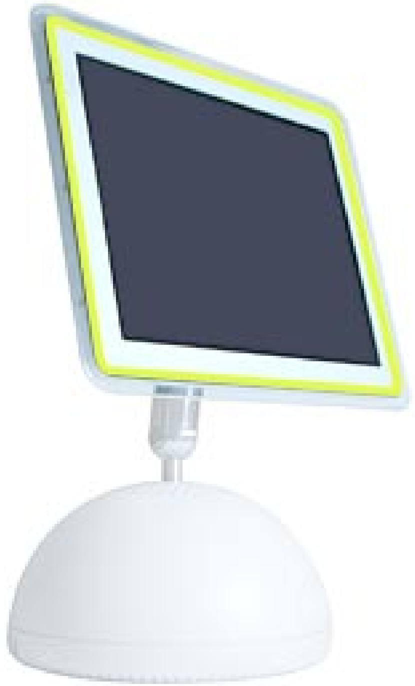
Display, Flat Panel

Tools

This procedure requires the following tools:

- Torx-10 screwdriver
- Plastic stylus to lift the panel

Part Location



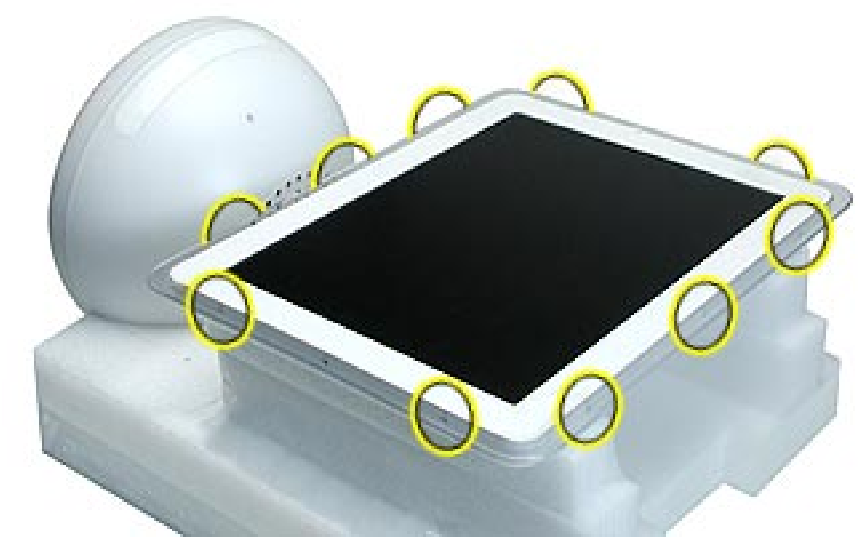
Preliminary Steps

Before you begin, do the following:

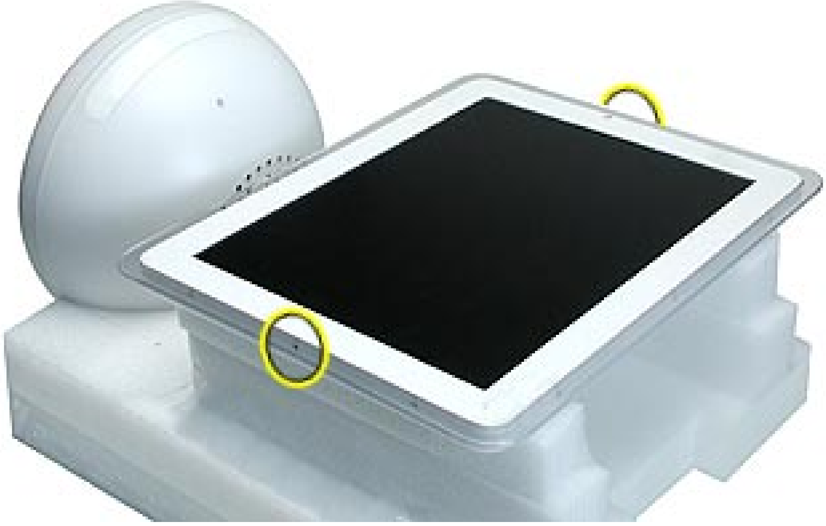
- Position the computer in the service stand.

Procedure

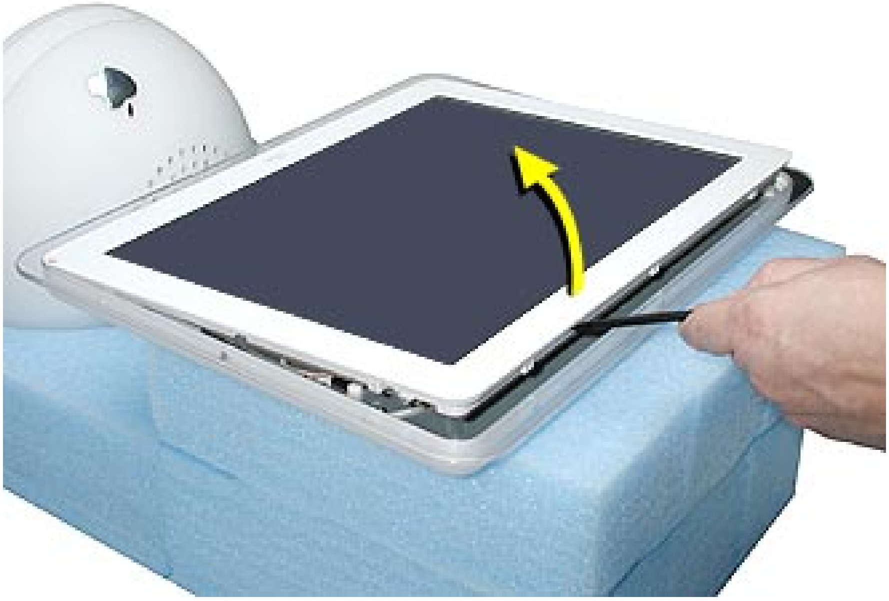
1. Remove ten screws connecting the back cover to the flat panel LCD display.



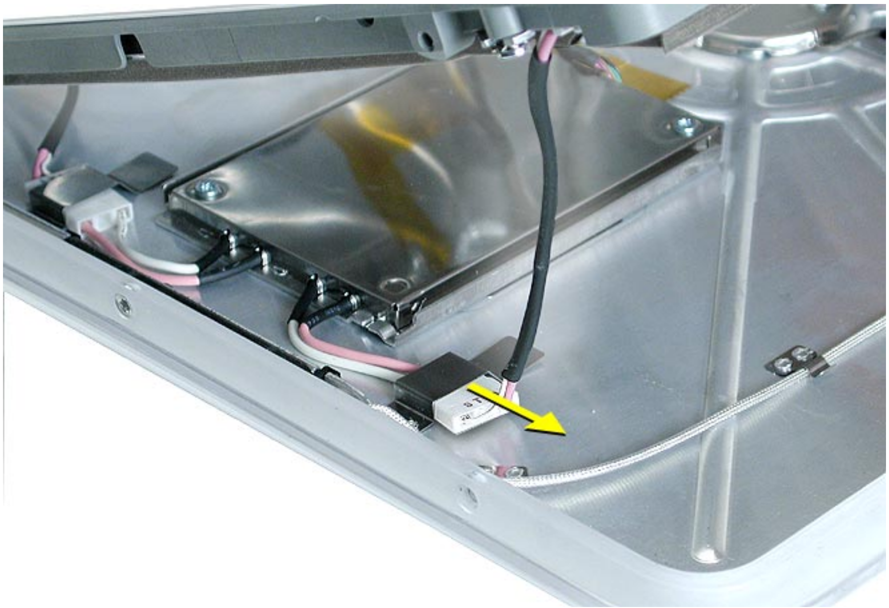
2. It is not necessary to remove the two screws shown below; these attach to the wireless antenna. **Note:** The wireless antenna screws are not self-tapping.



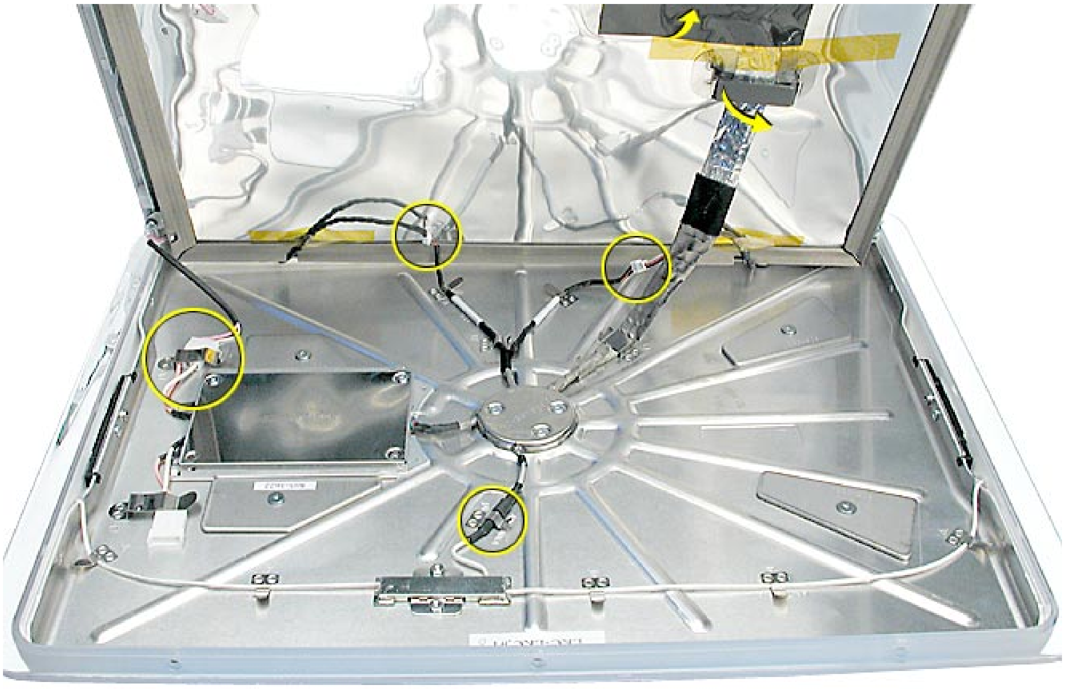
3. With a plastic tool, raise the display to access cables underneath the flat panel.



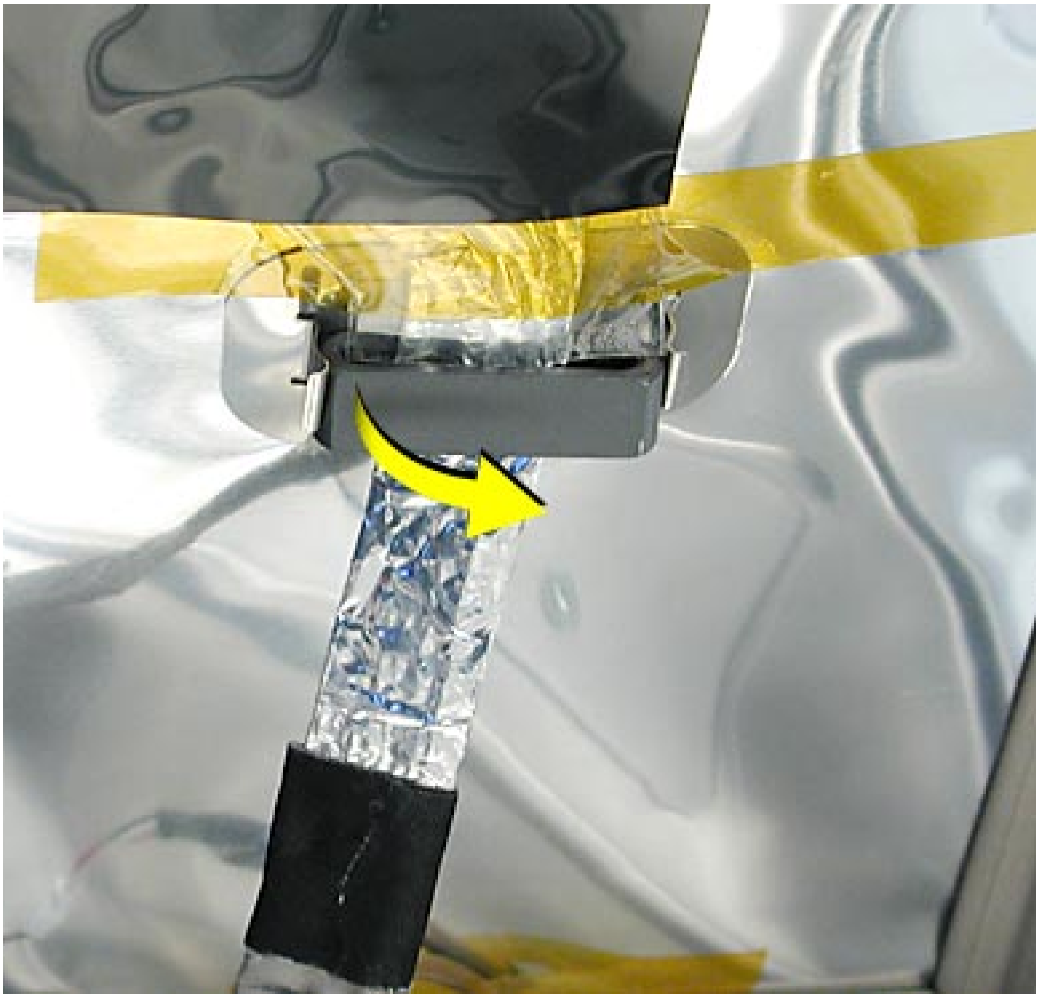
4. Disconnect the inverter cable shown below.



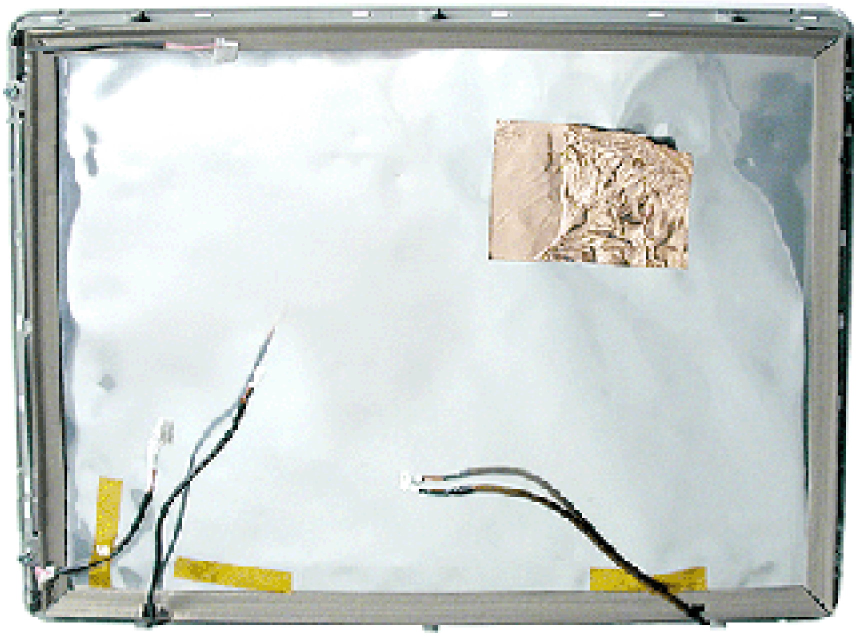
5. Raise the display to disconnect disconnect the circled items: the antenna, the inverter cable, the microphone, and the power on LED. Then, peel the tape away from the video connector and open the clip to release the video cable (see next page for a close up of the clip). **Note:** View this page at a larger size to enlarge the graphic.



6. This shows a close up view of the video cable and clip.



7. Lift the flat panel off the back cover. You are left with the LCD flat panel service part.



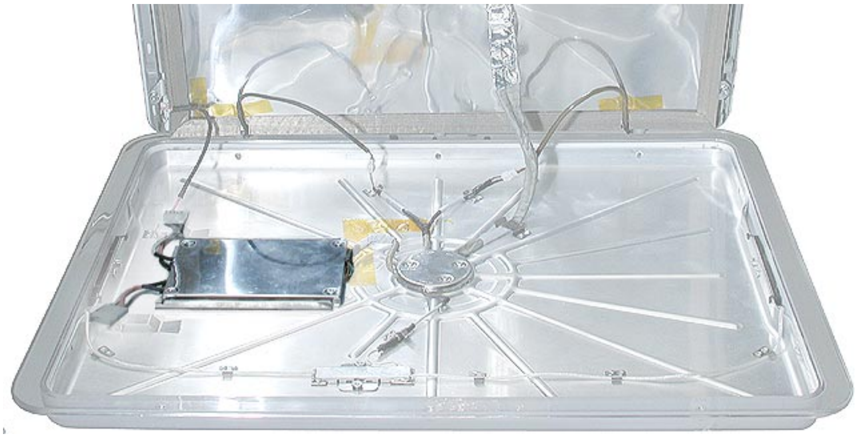
Inverter

Tools

This procedure requires the following tools:

- Torx-8 screwdriver

Part Location



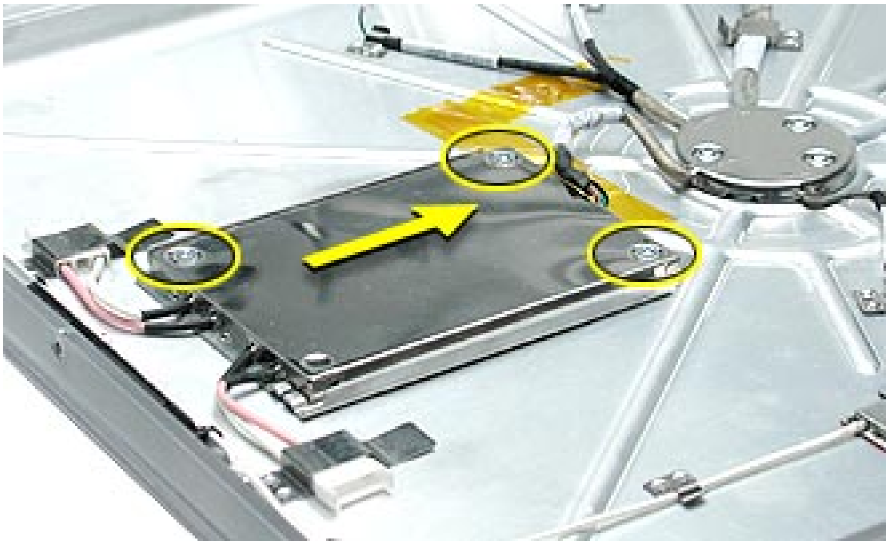
Preliminary Steps

Before you begin, do the following:

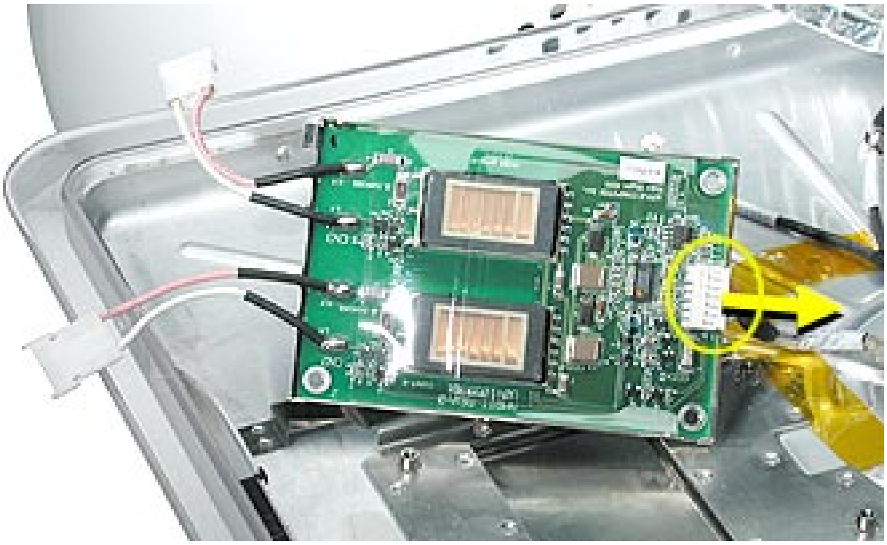
- Position the computer in the service stand.
- Remove the flat panel display.

Procedure

1. Remove the three screws and then slide the inverter in the direction of the arrow.



2. Turn the inverter over and disconnect the inverter neck cable.



3. Remove the inverter from the display support shield.

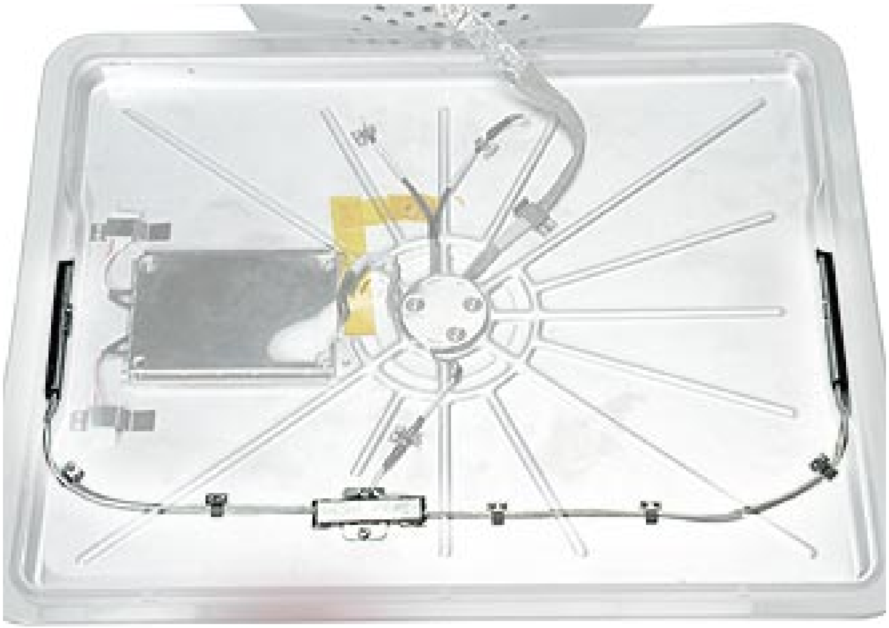
Antenna, Wireless

Tools

This procedure requires the following tools:

- Torx-6 screwdriver, or allen head
- Torx-8 screwdriver
- 5mm socket

Part Location



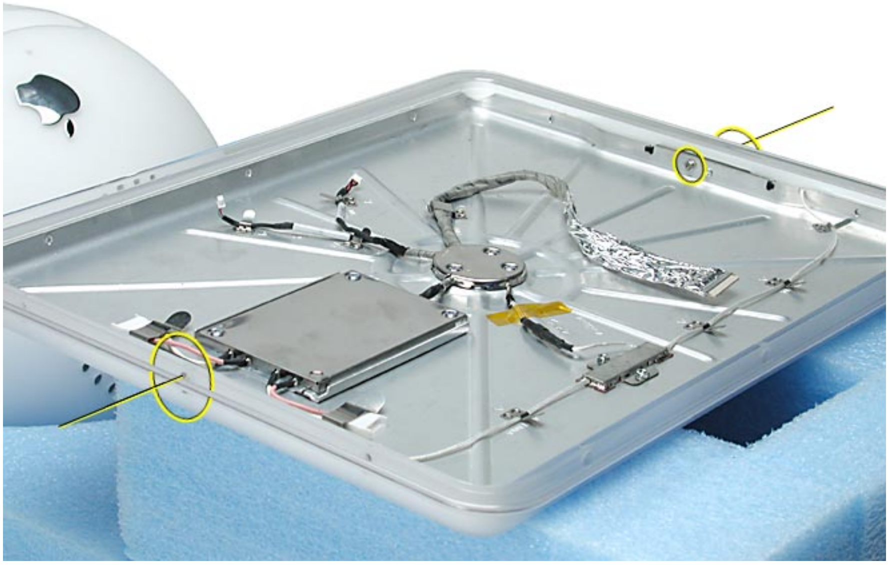
Preliminary Steps

Before you begin, do the following:

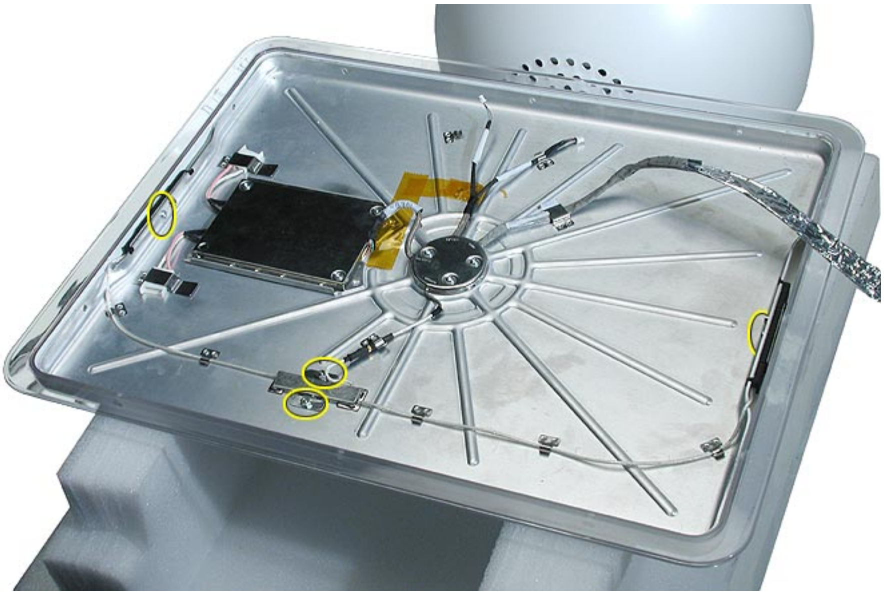
- Position the computer in the service stand.
- Remove the flat panel display.

Procedure

1. Remove two external T-6 screws attaching the antenna to the back cover **Note:** View this page at a larger size to enlarge the graphics.



2. Remove the two internal antenna screws on the sides (shown by the circles) and the two 5mm nuts connecting the wireless antenna to the panel shield.



3. Remove the antenna from the metal clips on the panel shield. Lift the antenna from the panel shield.

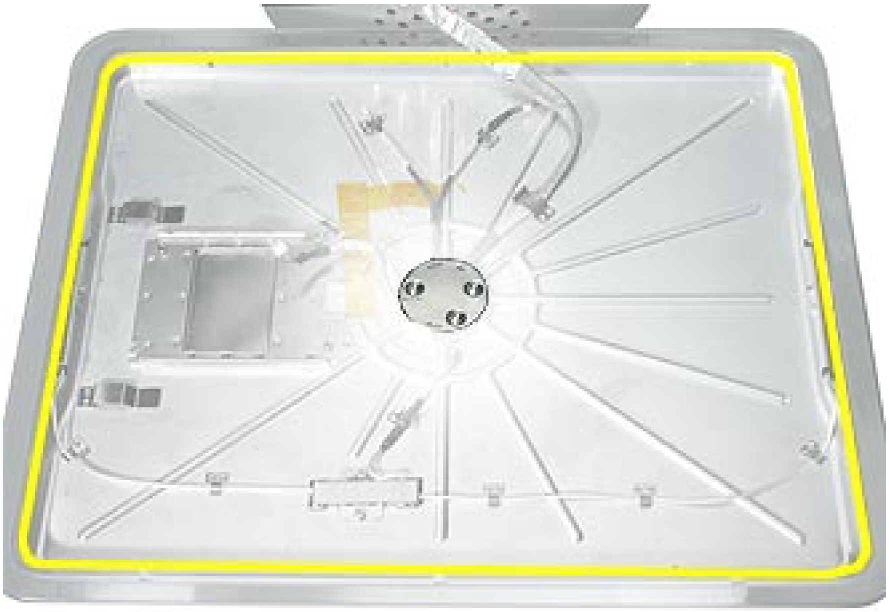
Panel Shield

Tools

This procedure requires the following tools:

- Torx-8 screwdriver
- Torx-10 screwdriver

Part Location



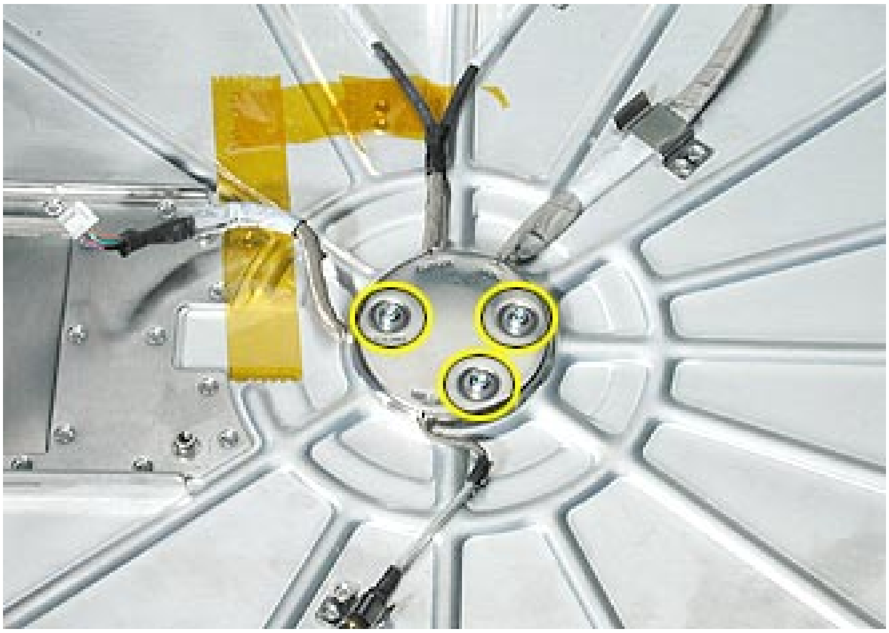
Preliminary Steps

Before you begin, do the following:

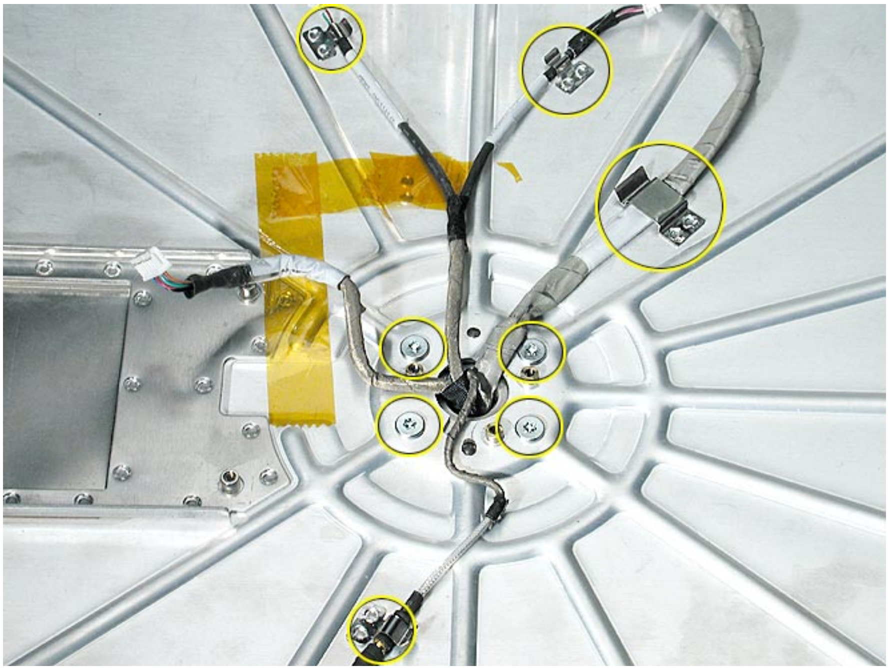
- Position the computer in the service stand.
- Remove the flat panel display.

Procedure

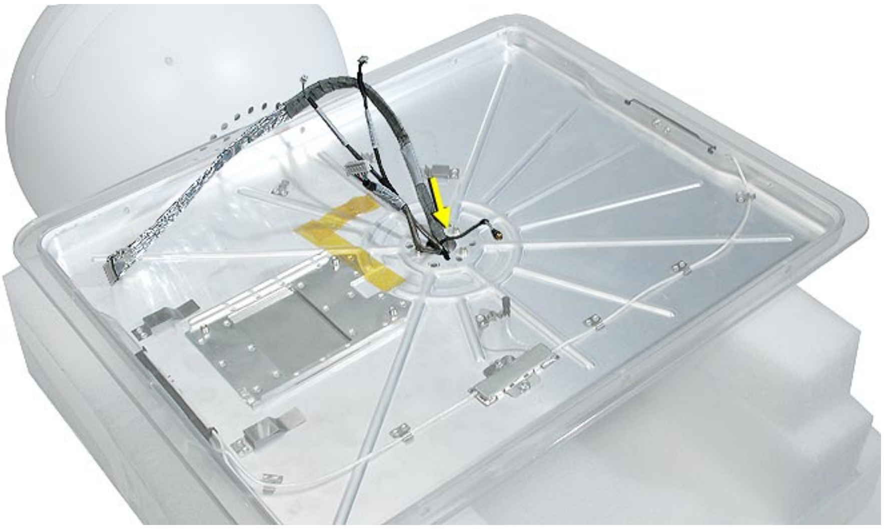
1. Remove the three T-8 screws on the metal cable retainer. Lift the cable retainer off the panel shield.



2. Remove the four T-10 screws on the panel shield. Next, release the cables from the metal clips on the panel shield. **Note:** View this page at a larger size to enlarge this graphic.

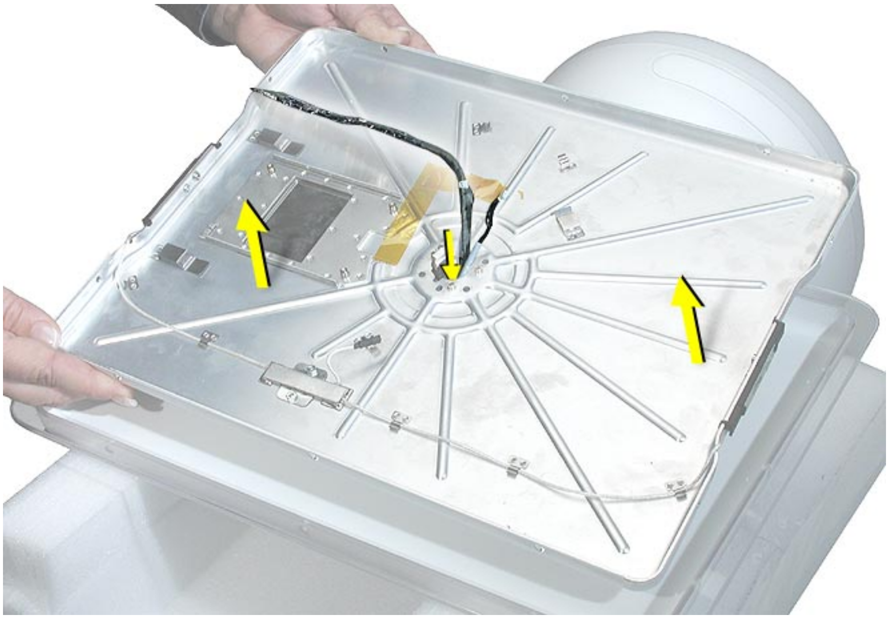


3. Gently pull the cables through the hole in the panel shield.

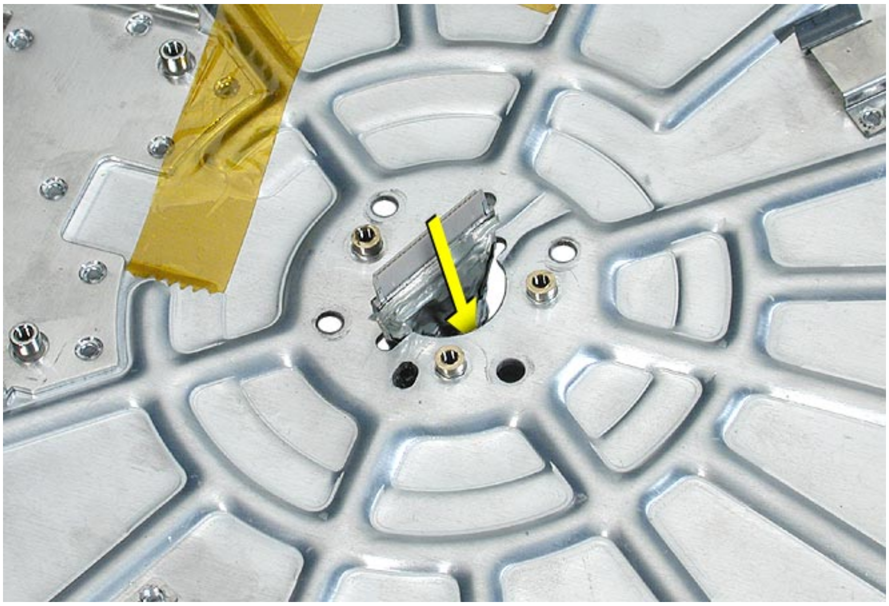


4. Line up the notches on the panel shield hole with the video cable. Gently pull the video cable through the panel shield (See next graphic for a close-up of the video cable going through the hole). Lift the shield off the back cover being careful not to scratch the white coating on the back cover.

Note: View this page at a larger size to enlarge the graphics.



5. This is a close-up of the video cable going through the hole in the panel shield.

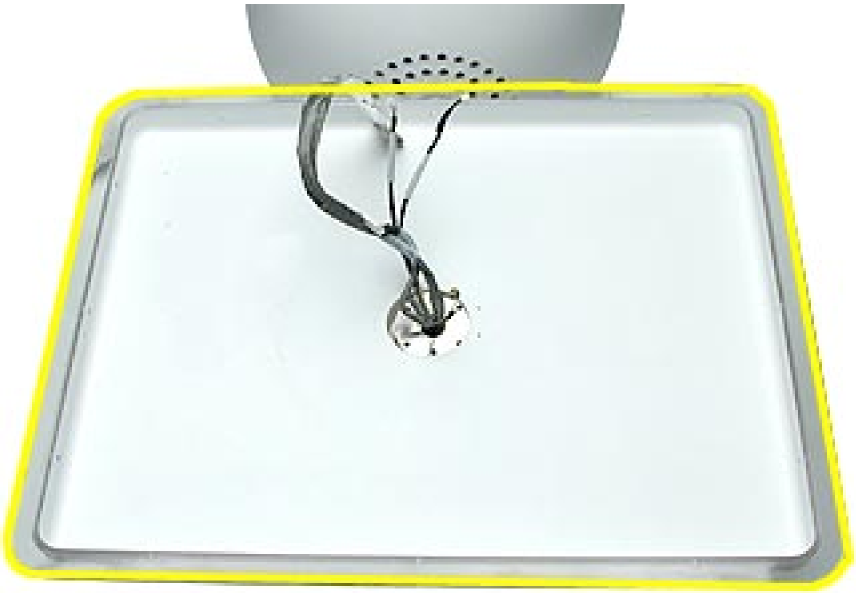


Back Cover, Display

Tools

No tools are required.

Part Location



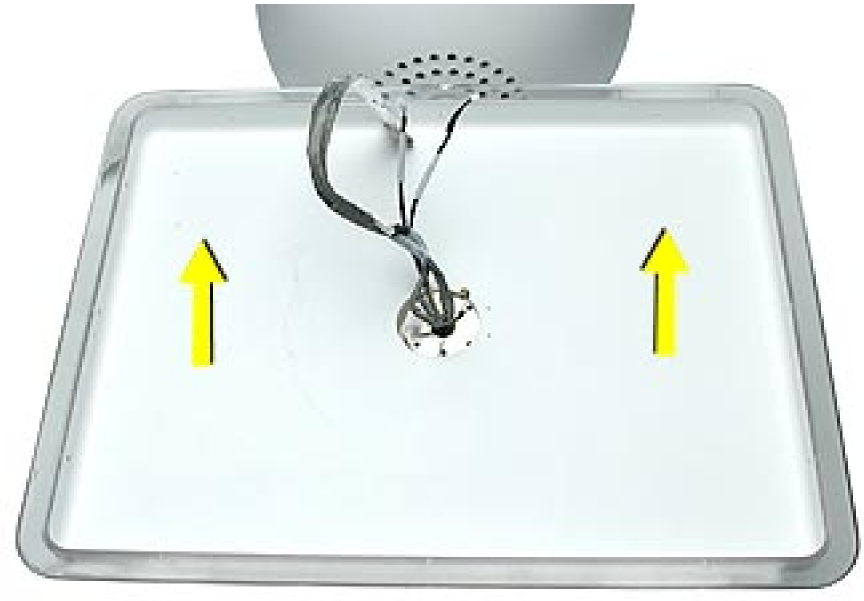
Preliminary Steps

Before you begin, do the following:

- Position the computer in the service stand.
- Remove the flat panel display.
- Remove the panel shield.

Procedure

1. Lift the display cover off the neck assembly.

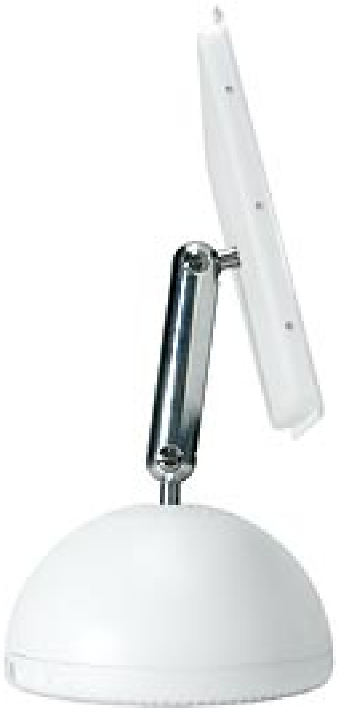


Neck Assembly

Tools

This procedure requires the following tools:
- Torx-10 screwdriver

Part Location



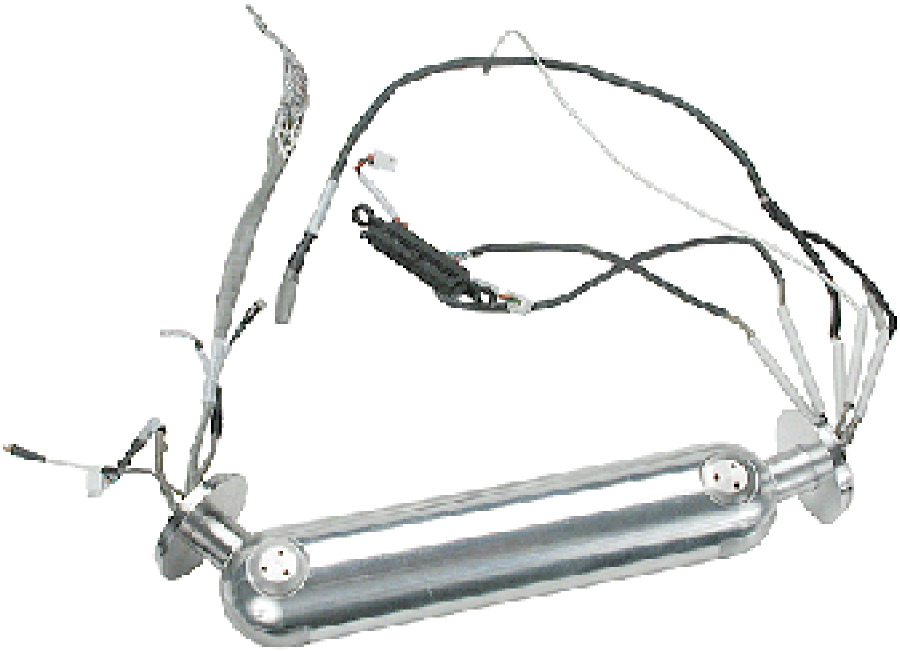
Preliminary Steps

Before you begin, do the following:
- Position the computer in the service stand.
- Remove the user access plate.
- Remove the bottom housing.
- Remove the drive carrier assembly.
- Remove the power supply.
- Remove the power supply insulators.
- Remove the fan.

- Remove the plastic cable retainer (under the fan).
- Remove the cap spoke holder.
- Remove the blind mate connector screws.
- Remove the Faraday cage.
- Remove the outer plastic housing.
- Remove the flat panel display.
- Remove the panel shield.
- Remove the back cover

Procedure

The neck assembly is attached to the computer base at one end and to the flat panel at the other end. To remove the neck assembly from the computer, follow all the take-apart procedures. When you are finished, you will be left with the neck assembly shown below.



Service Source

Upgrades

iMac (Flat Panel)

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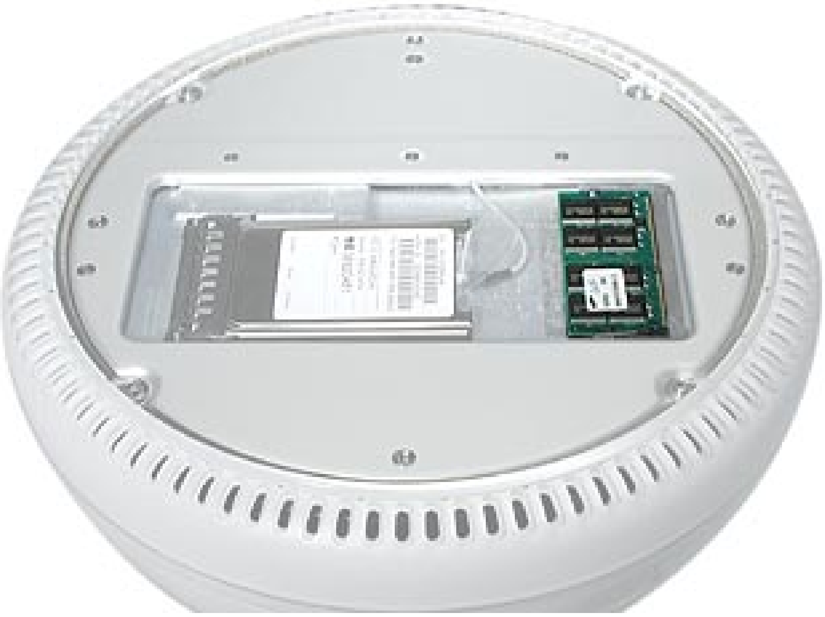
Memory, SO-DIMM

Tools

- Phillips #0 screwdriver.

Part Location



The iMac has two RAM expansion slots. The factory-installed RAM slot accepts a standard PC133 168-pin DIMM (up to 512 MB in capacity) and is accessible only by an Apple Authorized Service Provider. The user-accessible slot (shown above) accepts a standard PC133 144-pin SO-DIMM and is normally used for added RAM. Only the SO-DIMM slot is accessible by the user. A SO-DIMM for the iMac computer can contain either 64, 128, 256, or 512 MB of memory.

Note: This procedure describes installing a SO-DIMM memory module in the user-accessible slot.

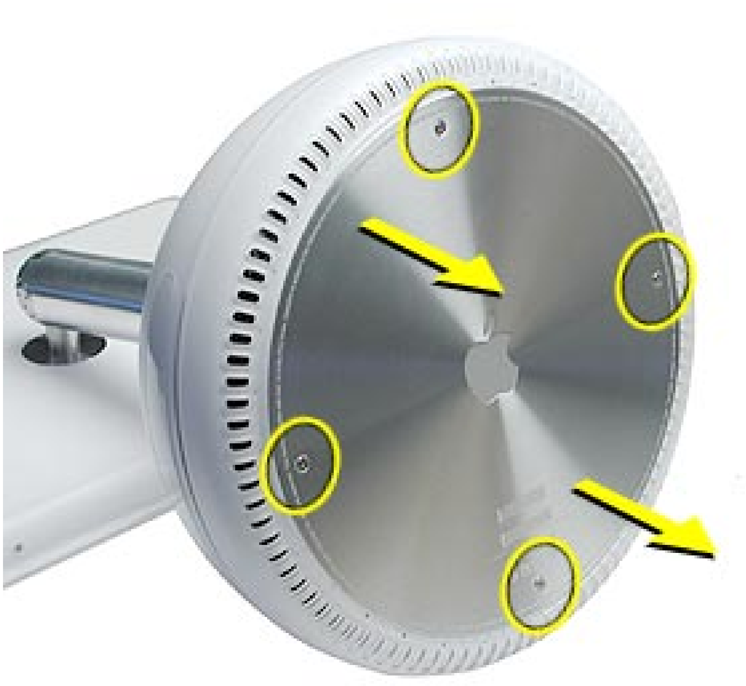
Procedure

Opening the Computer

Warning: The computer must be turned off before RAM modules are removed or inserted. To remind you, a red LED is visible in the access door. If the red LED is on, power is on, and must be turned off before changing RAM modules.

1. Shut down the computer.
2. Unplug all cables from the computer except the power cord.
3. Lay the computer down on a soft cloth.

4. Loosen the four captive screws at the base of the computer and gently remove the access panel.



Important: To avoid electrostatic discharge, always ground yourself by touching metal before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed the installation and closed the computer.

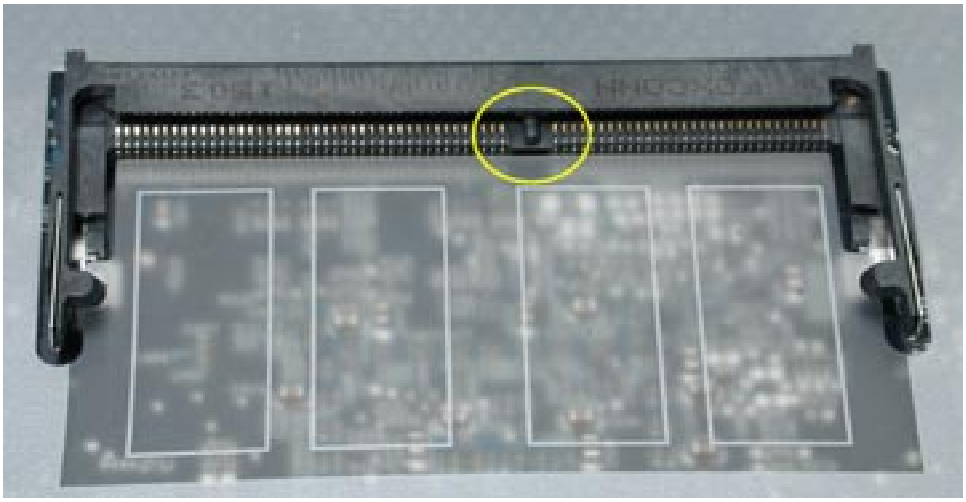
5. Touch a metal surface inside the computer.

6. Unplug the power cord.

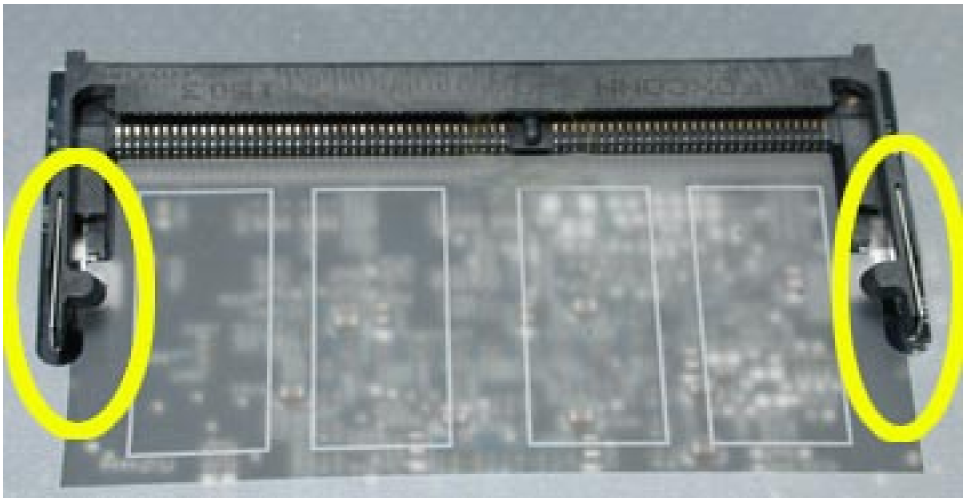
Installing the Memory Module

Note: If you are replacing a defective memory module, rather than adding a module, remove the defective module before proceeding.

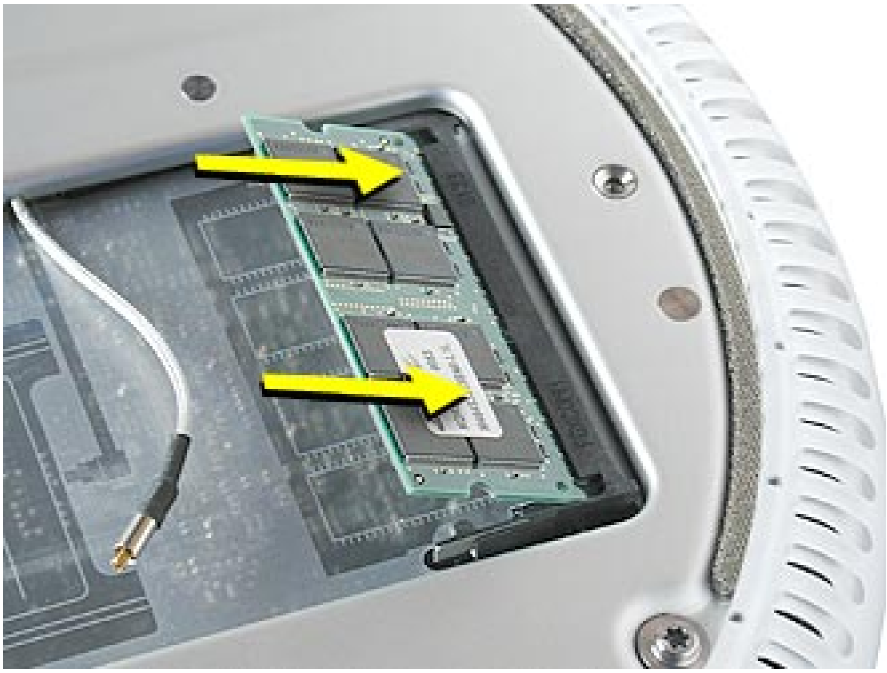
1. Line up the notch on the memory module with the notch (circled below) on the memory slot.



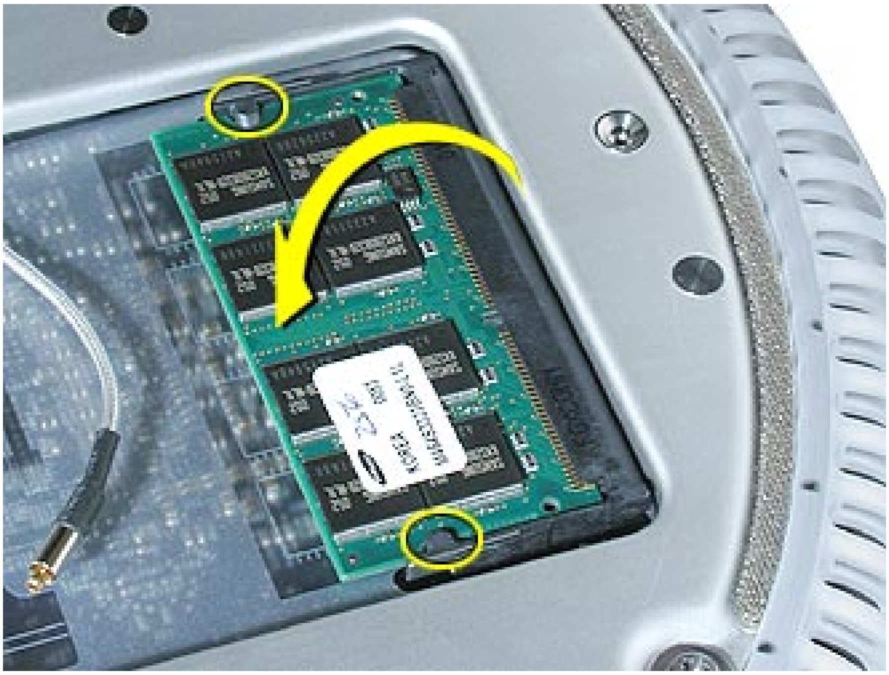
2. **Important:** Do not push the clips (circled below) when inserting memory. They are used to remove memory from the slot, not to insert memory. These clips are fragile and can break.



3. Gently insert the memory module into the slot. You will hear a click when the memory is completely inserted into the slot. **Note:** Make certain to push the memory module in the direction of the arrows.

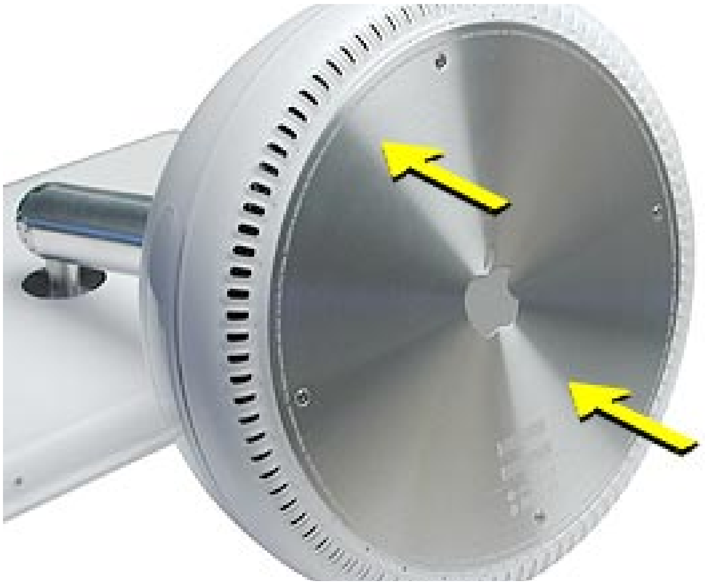


4. Press down gently on the memory until you hear it click into place under the two locking tabs (circled below) on the sides of the slot.



Closing the Computer

1. Replace the access panel and the four screws.



2. Reconnect all cables and restart the computer.

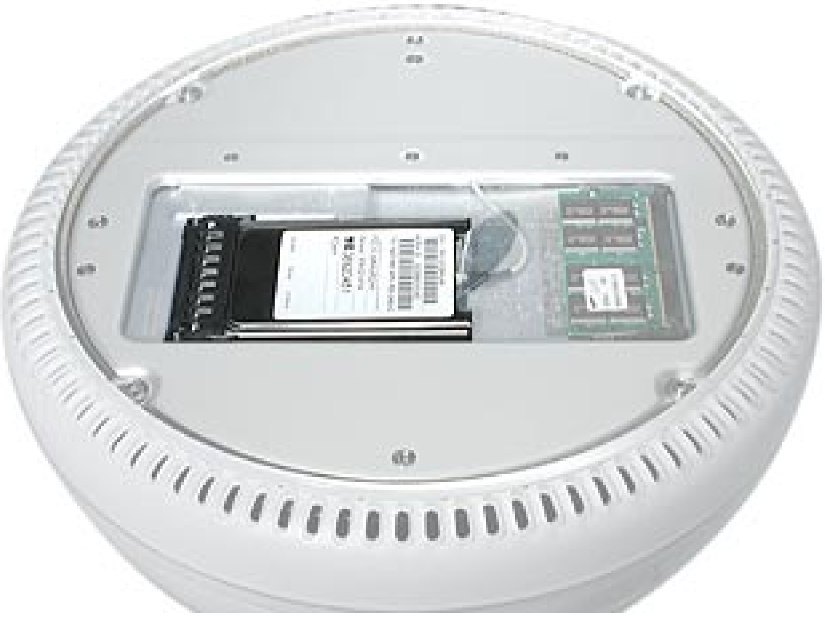
   Warning: Never turn on the computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

AirPort Card

Tools

- Phillips #0 screwdriver to remove the user access panel.

Part Location

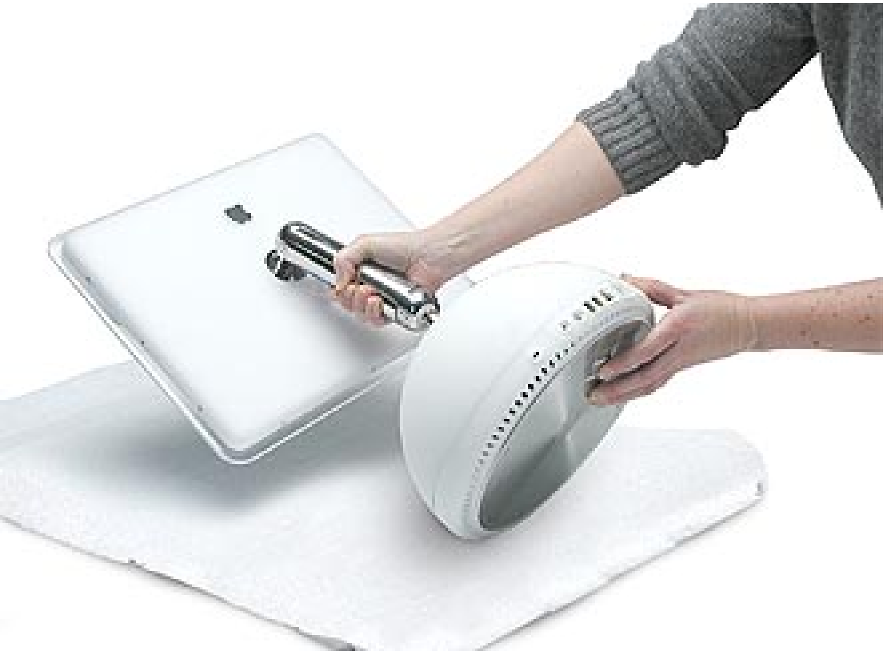


Note: Written and video instructions covering customer-insatiable parts are available at http://www.info.apple.com/installparts/.

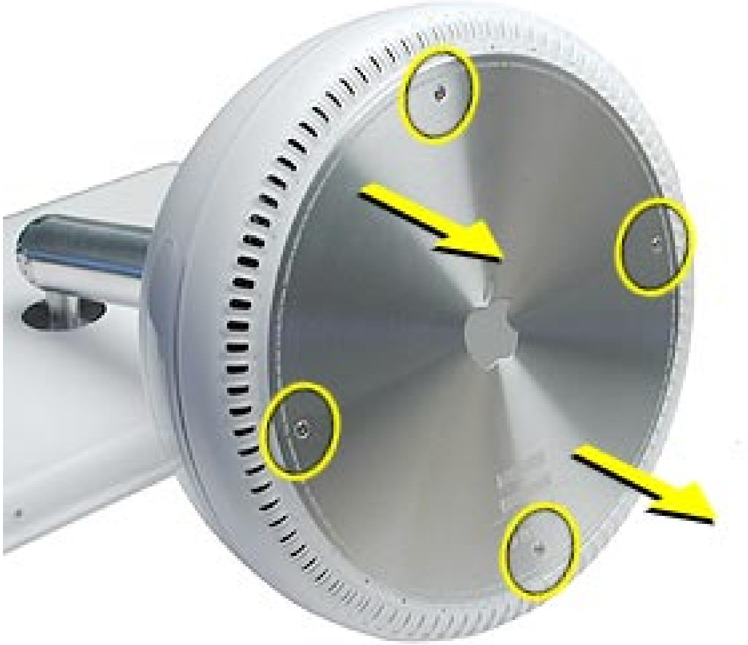
Opening the Computer

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. Shut down the computer and wait five minutes before continuing.

1. Unplug all cables from the computer except the power cord.
2. Lay the computer down on a soft cloth.



3. Loosen the four captive screws at the base of the computer and gently remove the access panel.



Important: To avoid electrostatic discharge, always ground yourself by touching metal before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed the installation and closed the computer.

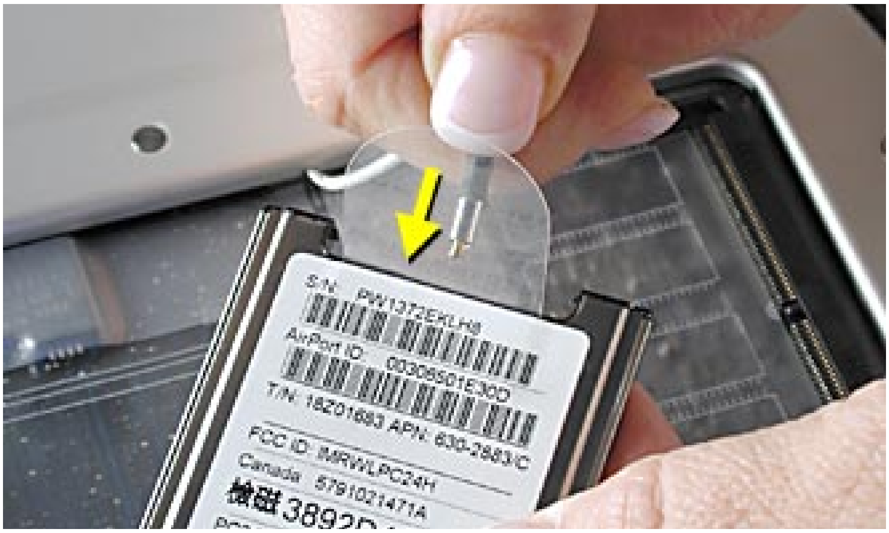
4. Touch a metal surface inside the computer.

5. Unplug the power cord.

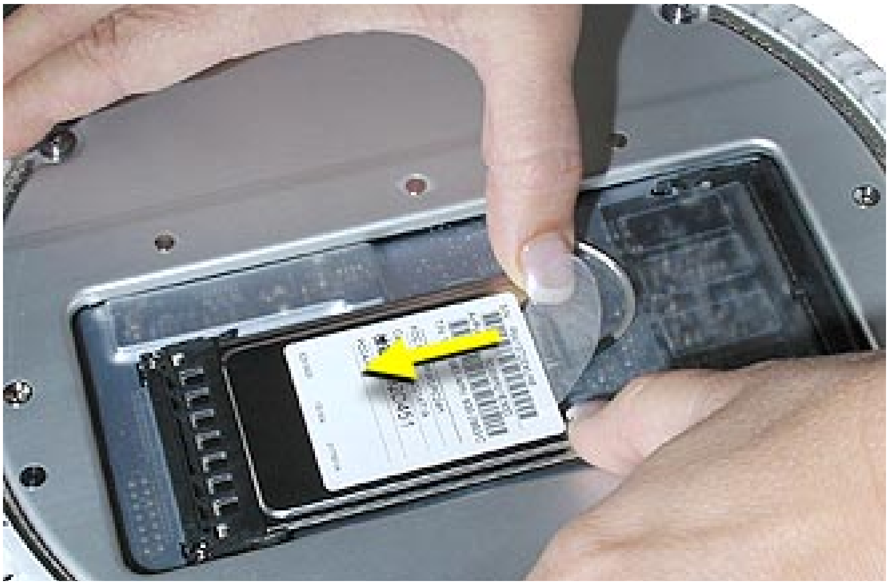
Installing the AirPort Card

Note: If you are replacing a defective AirPort Card, rather than adding a card, remove the defective card before proceeding.

1. Connect the AirPort antenna firmly to the AirPort Card.

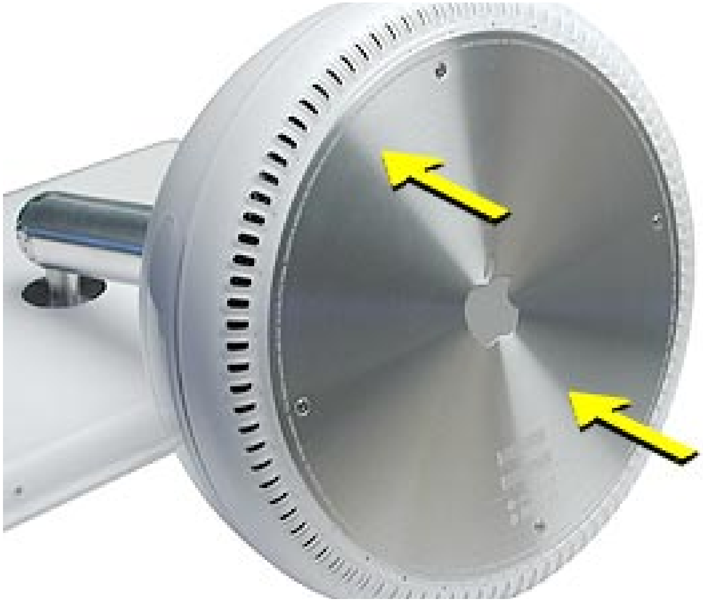


2. Insert the card into the AirPort Card slot.



Closing the Computer

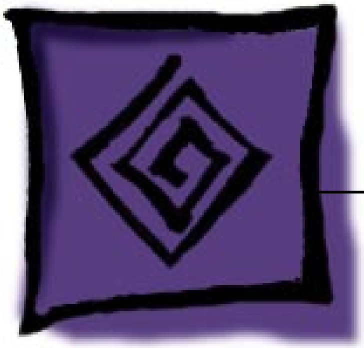
1. Replace the access panel and tighten the four captive screws.



2. Reconnect all cables and restart the computer.

   Warning: Never turn on the computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

Service Source



Troubleshooting

iMac (Flat Panel)

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General Information

What’s New and Different:

1. **Important:** The logic board has 3 thermal pads on the bottom side of the logic board. These pads must be changed each time the main logic board is removed from the bottom housing. Failure to replace these pads may cause the microprocessors to overheat and become damaged. (An exception would be if you are simply testing the logic board and only detach it for a few minutes.)

   Refer to the Take Apart chapter, “Thermal Pad Installation”.

2. **Important:** The CPU uses a thermal pipe to transfer heat away. This pipe has a thermal connection to the top metal chassis (Faraday cage). This connecting point must be cleaned and have new thermal paste applied to it each time the bottom housing is removed. If the mating surfaces are not cleaned and thermal paste is not used, the CPU may overheat and become damaged. There is no exception to this. **Note:** Most service procedures require the bottom housing to be removed.

   Refer to the Take Apart chapter, “Thermal Paste Application”.

3. **Important:** The bottom plate has 4 screws that must be tightened to at least 17 in.-lbs. If you do not have a torque driver, you will have to make sure these bolts are firmly tightened (by hand or purchase the service tool (076-0899) in order to ensure the thermal pipe is firmly mated with the top base. If the bottom plate is not securely attached to the base in this fashion the CPU may overheat and become damaged.

4. Special service tools are required to perform some procedures. A service stand, 076-0898, to hold the unit during take apart and service cables, 076-0897, that allow the unit to run while the bottom housing is open. **Important:** The unit cannot be run for more than five minutes with the bottom housing open. If it is open longer, the CPU may overheat and become damaged.

5. The CPU is now G4 based, running at speeds of 700 MHz and 800 MHz.

6. The display is a TFT LCD panel with a maximum resolution of 1024 x 768. The display is connected to the unit via a tilt and swivel neck extension.

7. Optical drive is now tray-loading, and is either a CD-RW, a DVD-ROM/CD-RW (Combo drive), or a DVD-R/CD-RW (Superdrive).

8. The computer contains a variable-speed fan. The fan speed increases as the unit needs more cooling.

9. The unit does not have NMI or Reset buttons. These functions have been taken over by the power button.

10. The sound-out port supports external digital audio speakers.

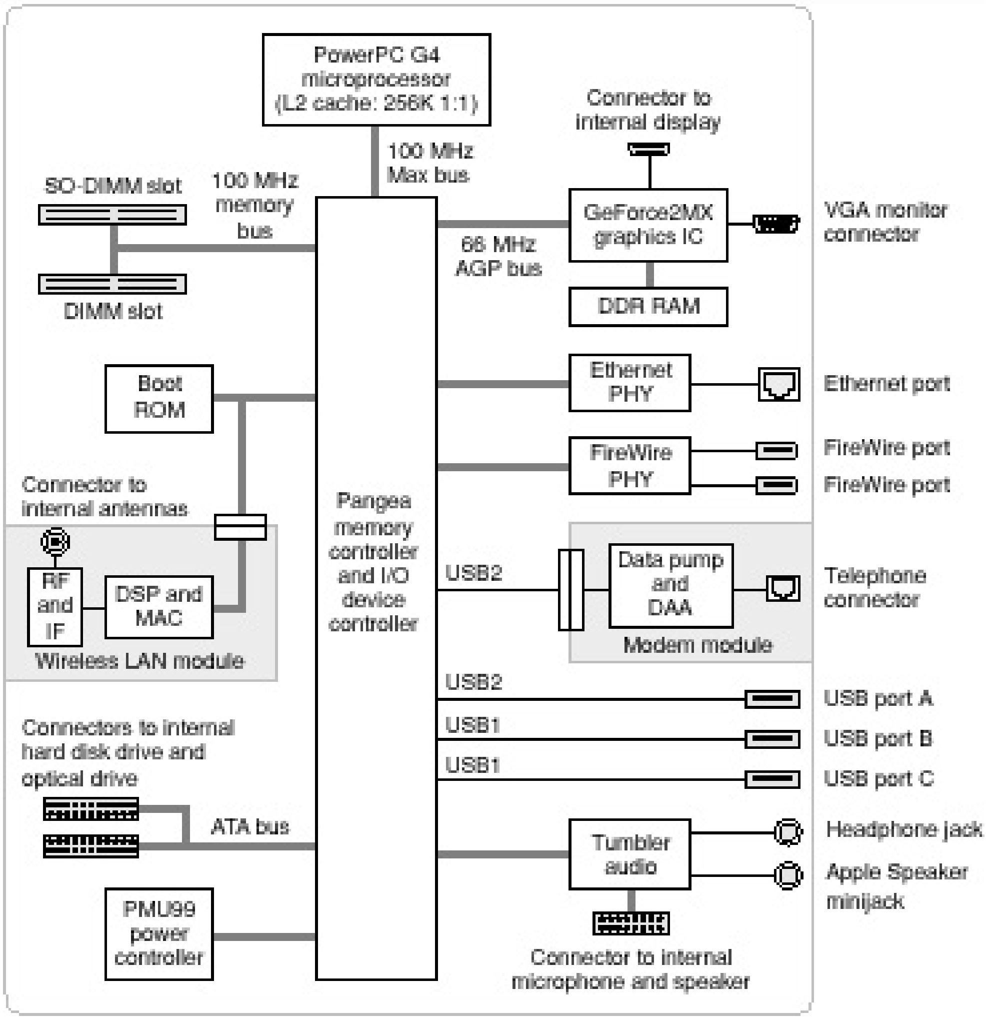
11. There are three USB ports on the iMac (Flat Panel); previous iMac models had two USB ports.

12. The iMac (Flat Panel) houses a different A/C power cord; power cords from older iMac models will not fit

into the A/C socket.

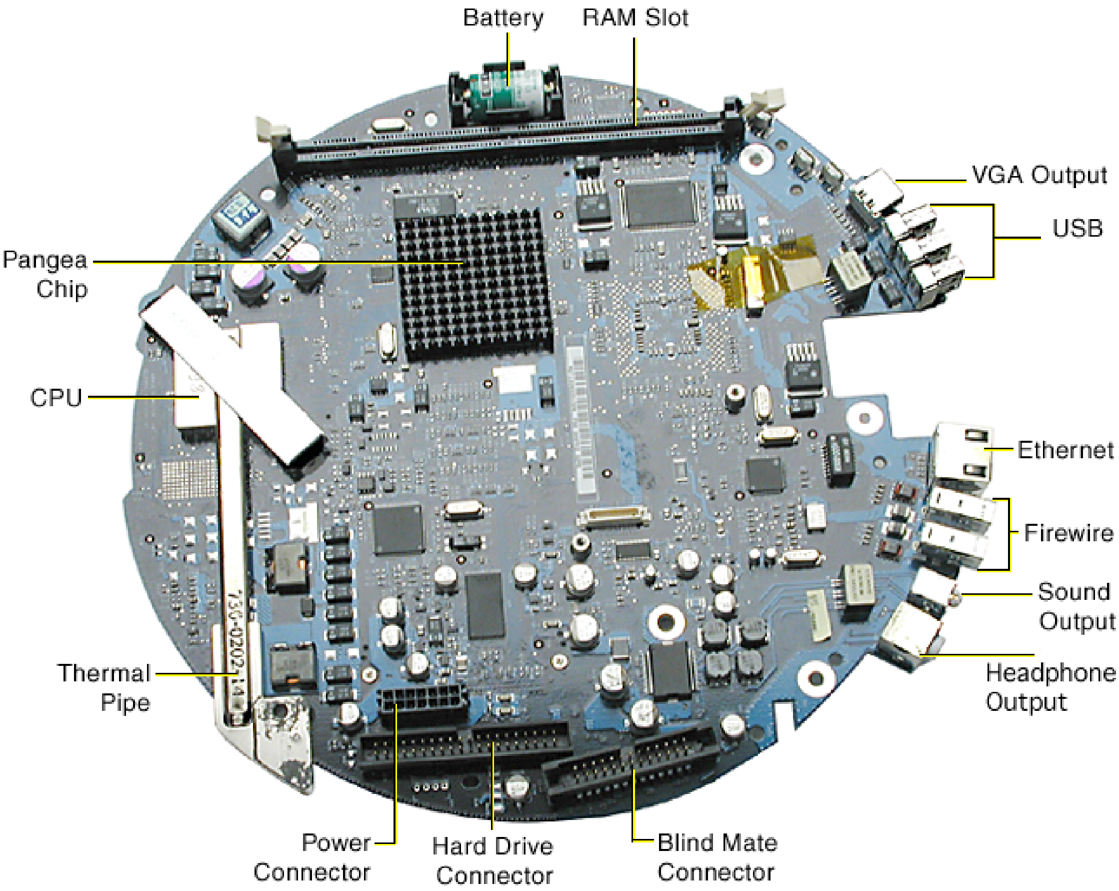
Block Diagram

The following illustration provides a simplified block diagram of the main logic board. The diagram shows the ICs and the buses that connect them together.


PowerPC G4 microprocessor (L2 cache: 256K 1:1)
100 MHz Max bus
SO-DIMM slot
100 MHz memory bus
DIMM slot
Connector to internal display
GeForce2MX graphics IC
68 MHz AGP bus
VGA monitor connector
DDR RAM
Boot ROM
Ethernet PHY
Ethernet port
FireWire PHY
FireWire port
FireWire port
Connector to internal antennas
RF and IF
DSP and MAC
Wireless LAN module
Pangea memory controller and I/O device controller
USB2
Data pump and DAA
Modem module
Telephone connector
USB2
USB port A
USB1
USB port B
USB1
USB port C
Connectors to internal hard disk drive and optical drive
ATA bus
PMU99 power controller
Tumbler audio
Headphone jack
Apple Speaker minijack
Connector to internal microphone and speaker

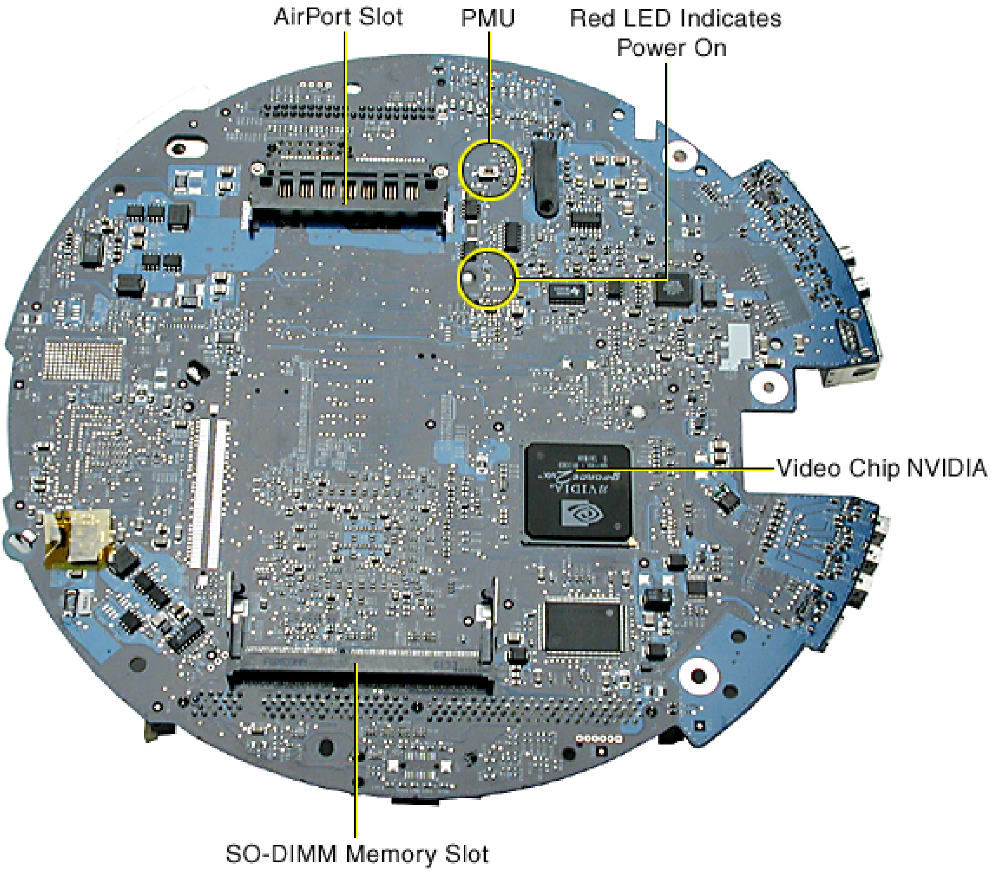
Logic Board, Top

Note: Enlarge the page to view the graphic at a larger size.

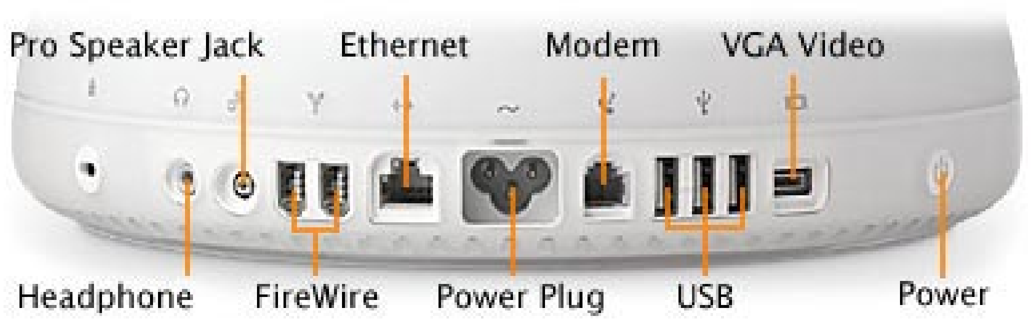

Battery
RAM Slot
VGA Output
USB
Pangea Chip
CPU
Ethernet
Firewire
Sound Output
Headphone Output
Thermal Pipe
Power Connector
Hard Drive Connector
Blind Mate Connector

Logic Board, Bottom

Note: Enlarge the page to view the graphic at a larger size.


AirPort Slot
PMU
Red LED Indicates Power On
Video Chip NVIDIA
SO-DIMM Memory Slot

I/O Ports


Pro Speaker Jack
Ethernet
Modem
VGA Video
Headphone
FireWire
Power Plug
USB
Power

Service Cables

Three extension cables (076-0897) are required when troubleshooting the iMac with the bottom housing open, as shown below.

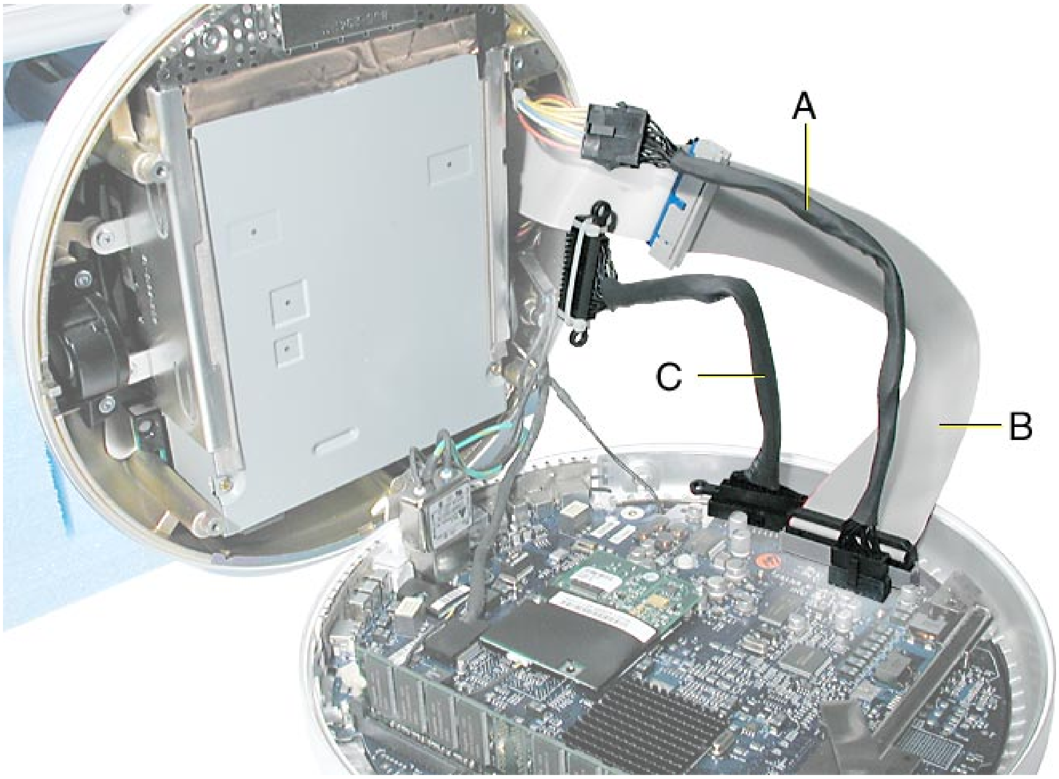
Connect the cables as shown below.

A= power cable

B= drive data cable

C= blind mate connector

Note: Enlarge the page to view the graphic at a larger size.



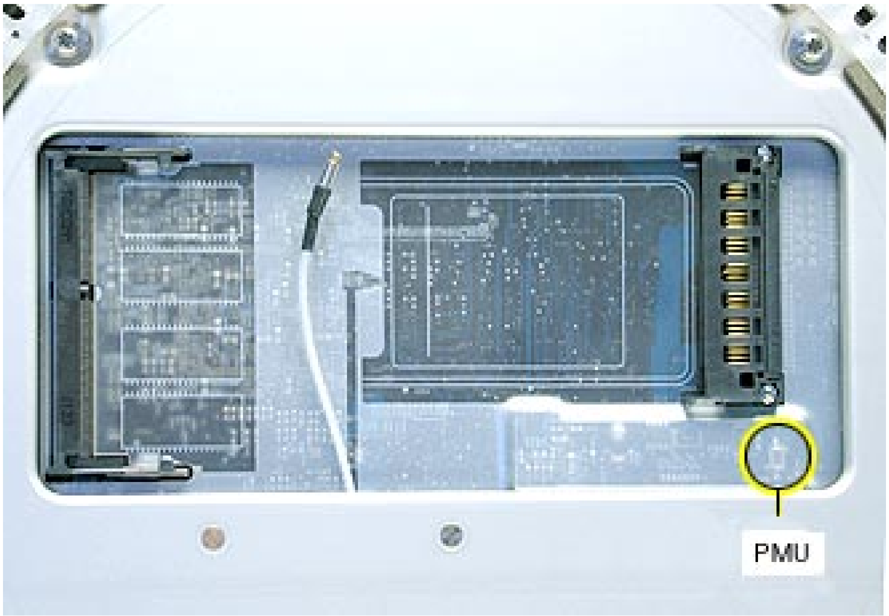
The PMU Chip

The PMU (Power Management Unit) is a microcontroller chip that controls all power functions for the computer. The PMU (location shown below) is a computer within a computer. It has memory, software, firmware, I/O, two crystals, and a CPU. Its function is to:

- Tell the computer to turn on, turn off, sleep, wake, idle, etc.
- Manage system resets from various commands.
- Maintain parameter RAM (PRAM).
- Manage the real-time clock.

Important: The PMU is **very** sensitive and touching the circuitry on the logic board can cause the PMU to crash. If the PMU crashes, the battery life goes from about five years to about two days if the PMU is not reset. Refer to the next topic, “Resetting the PMU on the Logic Board” for the procedure.

Many system problems can be resolved by resetting the PMU chip. The PMU reset button is located on the right side of the board, refer to the logic board diagram below.

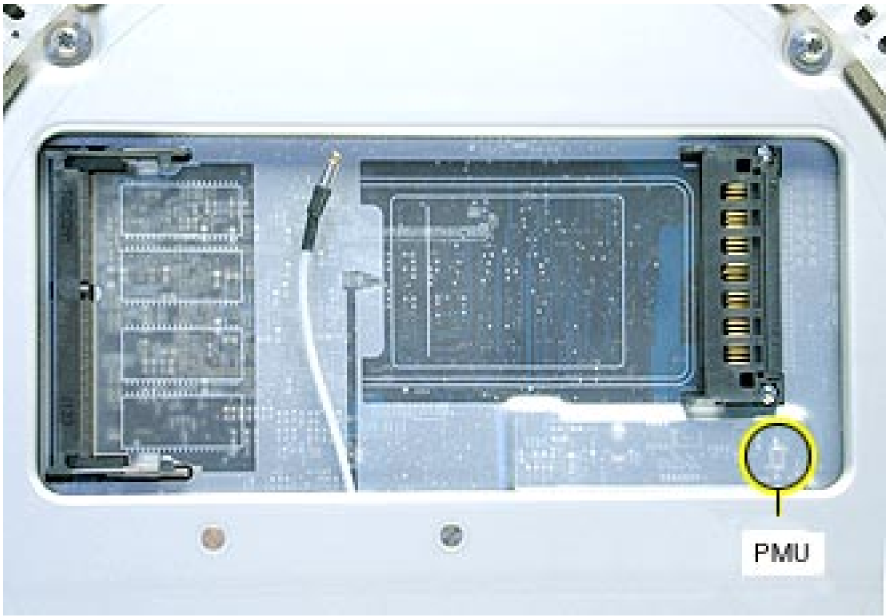


Location of the PMU Button

Resetting the PMU on the Logic Board

Resetting the PMU (Power Management Unit) on the logic board can resolve many system problems. Whenever you have a unit that fails to power up, you should follow this procedure before replacing any modules.

1. Disconnect the power cord.
2 Remove the user access panel from the bottom of the computer.
3 Press the PMU reset switch (shown below) once on the bottom side of the logic board and then proceed to step 3. Do **NOT** press the PMU reset switch a second time because it could crash the PMU chip.



4 WAIT ten seconds before connecting the power cord and powering the computer on. If the computer powers on, go to the next step. If the computer does not power on, there is something else wrong with the computer, refer to the symptom/cure, “No Power” in this chapter.
5. Run MacTest Pro and return the computer to the customer.

Note: This entire procedure resets the computer’s PRAM. Be sure to reset the computer’s time, date and other system parameter settings before returning the computer to the customer.

Power-On Self Test

There is a power-on self test that resides in the ROM of the iMac. This test automatically runs whenever the iMac is powered on after being fully shut down (the power-on self test does not run if the machine is only restarted).

If a problem is detected during the test, you will not hear a normal startup chime. Instead, the system will beep as explained below. Refer to “Error Beeps” later in this chapter for instructions on how to troubleshoot and repair an iMac that sounds error beeps at startup time.

Following is a definition of what the error beeps at startup time signify.

One Beep: No RAM is installed or detected.

Two Beeps: Incompatible memory is installed. (The iMac ships with PC-133 SDRAM).

Three Beeps: No RAM banks passed memory testing.

Four or Five Beeps: Bad checksum for the remainder of the boot ROM. The ROM is bad.

Logic Board Battery

Important: Apple highly recommends removing the battery when handling the logic board. Make sure to use proper ESD protection when handling modules.

The battery on the logic board controls the stored system settings, such as date and time. It is only necessary to test the battery when you can’t power on the computer, or the date and time are reset every time the AC power is removed.

The battery is also used to power the PMU chip (because the PMU chip keeps time and must always be running) when the computer is unplugged from the wall (AC power). The PMU is **very** sensitive and touching any circuitry that is connected to the PMU can cause it to crash. If the PMU crashes, the battery life goes from about five years to about two days if the PMU is not reset. Once the battery goes dead, the PMU will reset the time and date to 12:00 AM 1/1/04 every time the AC power is removed. To fix this situation, replace the battery and reset the PMU (refer to “Resetting the PMU on the Logic Board” mentioned earlier in this chapter).

If the computer has a “No Power” situation, check the battery before replacing modules. A drained battery may be indicative of a crashed Power Management Unit.

Does the battery measure at least +3.5v? If not, replace the battery and reset the PMU. If the battery does measure over +3.5v, reinstall the battery and reset the PMU as above.

Connect the power cord and power up the system again.

Warning: Whenever the bottom housing is opened for service, you must do two things:

1. You must clean and reapply thermal paste to the thermal pipe surface.

2. You must tighten the four torx bolts on the base unit to a minimum of 17 in.– lbs. Failure to follow either of these steps could cause the computer to overheat nd damage internal components.

Refer to the next topic, “Thermal Paste Application” for detailed information.

Thermal Paste Application

The following instructions explain how to apply thermal paste to the thermal pipe in the iMac (Flat Panel) computer. Failure to follow these instructions could cause the computer to overheat and damage internal components.

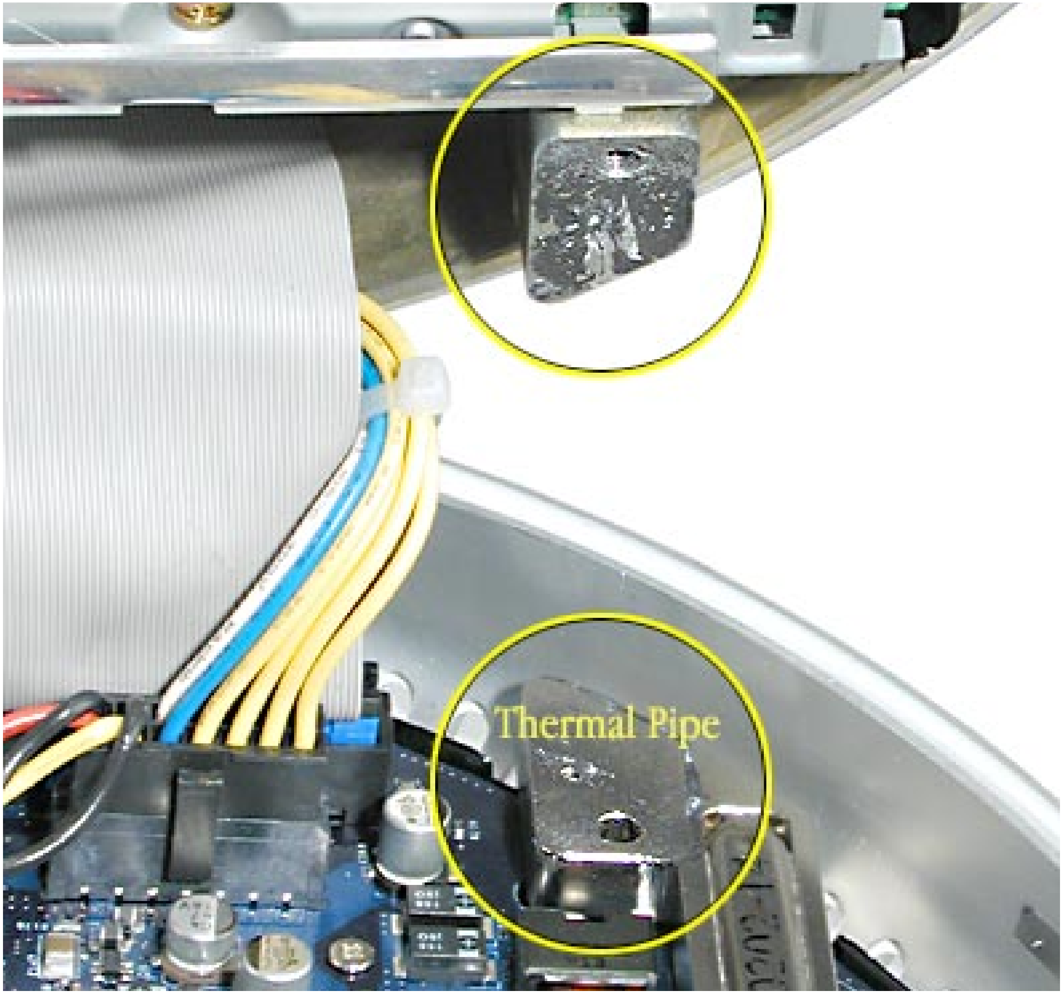
Tools

This procedure requires the following tools:

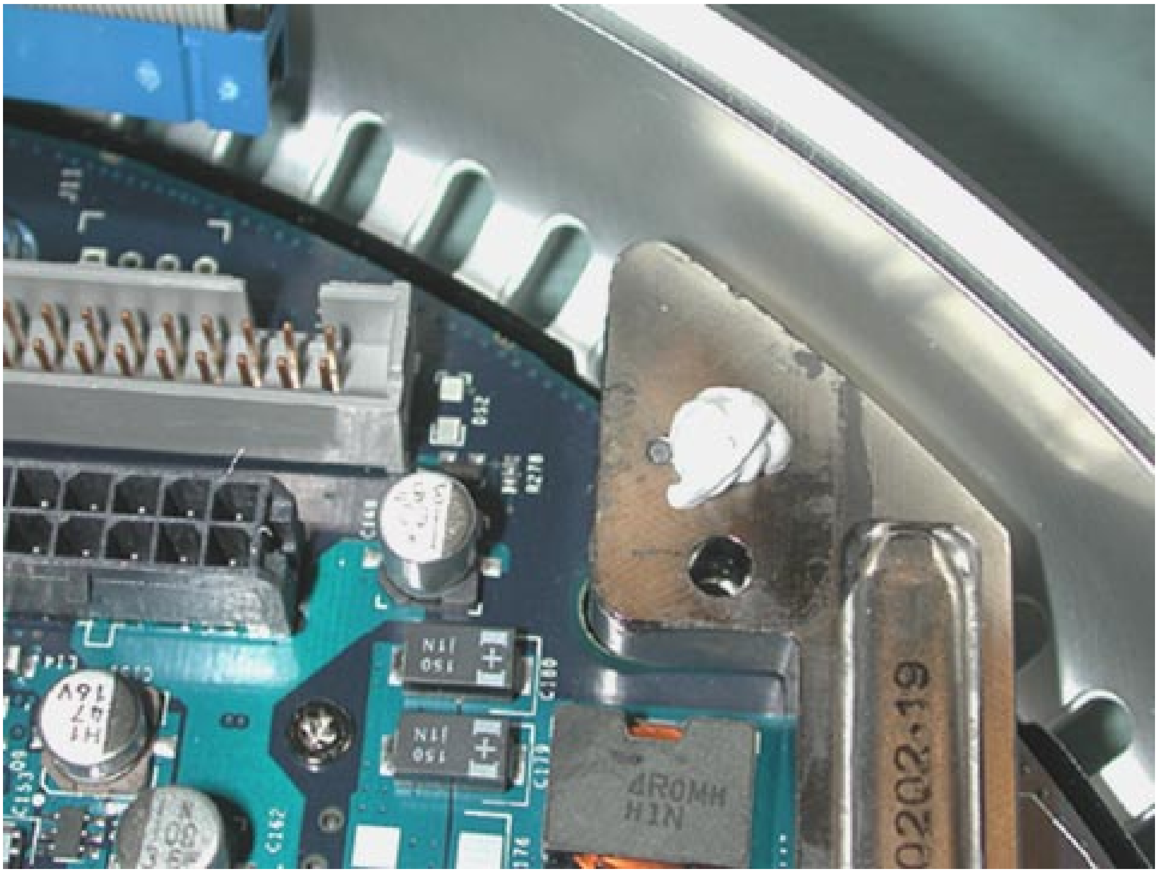
- Plastic stylus or nylon probe tool (922-5065) to remove the old thermal paste
- Thermal paste (922-4757), each tube contains 4-5 applications

Procedure

1. Thoroughly clean the thermal film from the mating surfaces (circled below). Use a plastic stylus to scrape the surfaces clean. **Note:** Do not use an abrasive material or liquid cleaner.



2 Squeeze a drop of thermal paste onto the middle of the thermal pipe surface as shown below. **Note:** In testing, the drop of thermal paste shown below completely covered the entire thermal pipe surface. Place at least this much paste on the thermal pipe.



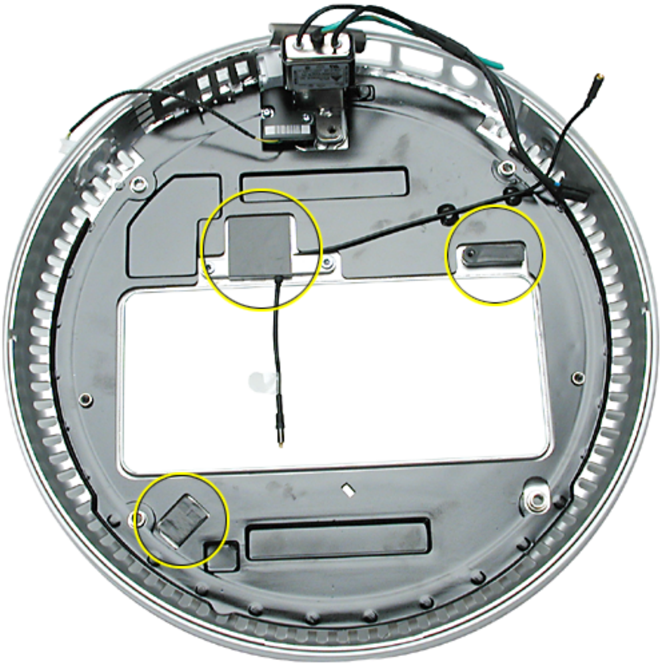
3. Close the bottom housing. Securely fasten the four mounting torx screws very firmly (at least 17 in.–lbs. is necessary). **Important:** If you don't have access to a calibrated torque driver make certain that the screws are tightened firmly. You don't need a torque driver; however, there is one available from Apple if you feel you need it. The torque driver part number is 076-0899.

Thermal Pad Replacement Instructions

The following instructions explain how to replace the thermal pads in the iMac (Flat Panel) computer. These pads must be changed each time the main logic board is removed from the bottom housing. No tools are required for this procedure

Procedure

1. Remove the old thermal pads (circled below) from the bottom housing. **Note:** If you don’t see all three thermal pads on the bottom housing, check the bottom side of the logic board.



2. Using the thermal pad kit, remove the clear protective backing from the new thermal pads.
3. Place the new thermal pads in the bottom housing. **Note:** Avoid unnecessary contact with either side of the thermal pad as dirt and body oils reduce the thermal pad's conductivity.
4. Press down on the blue protective backing to make sure each thermal pad has even contact with the bottom housing. There should be no air pockets.
5. Remove the blue protective backing from the new thermal pads.
6. Replace the logic board. **Warning:** Replace the thermal pads. Refer to “Thermal Pad Replacement Instructions” mentioned earlier in this chapter.

Symptom Charts

How to Use the Symptom Charts

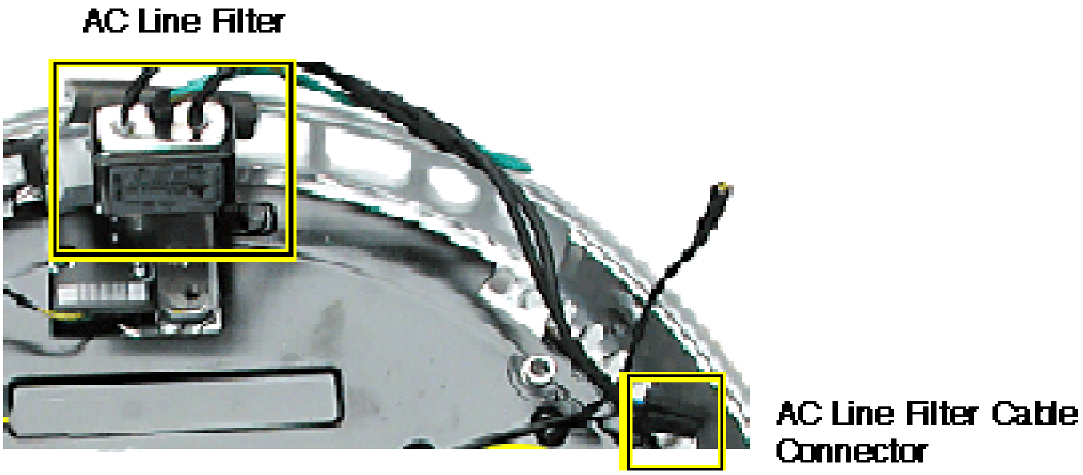
The Symptom Charts included in this chapter will help you diagnose specific symptoms related to the product. Because cures are listed on the charts in the order of most likely solution, try the cures in the order presented. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure.

Note: If you have replaced a module, reinstall the original module before you proceed to the next cure.

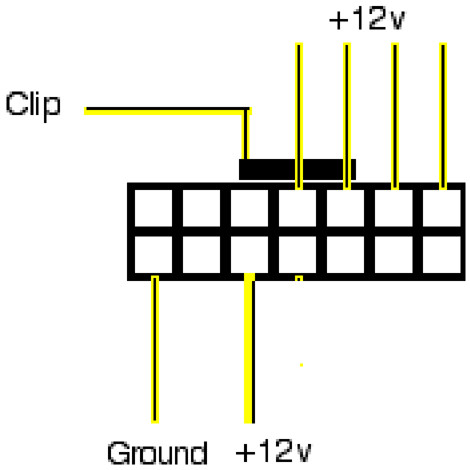
No Power

The computer will not power on.

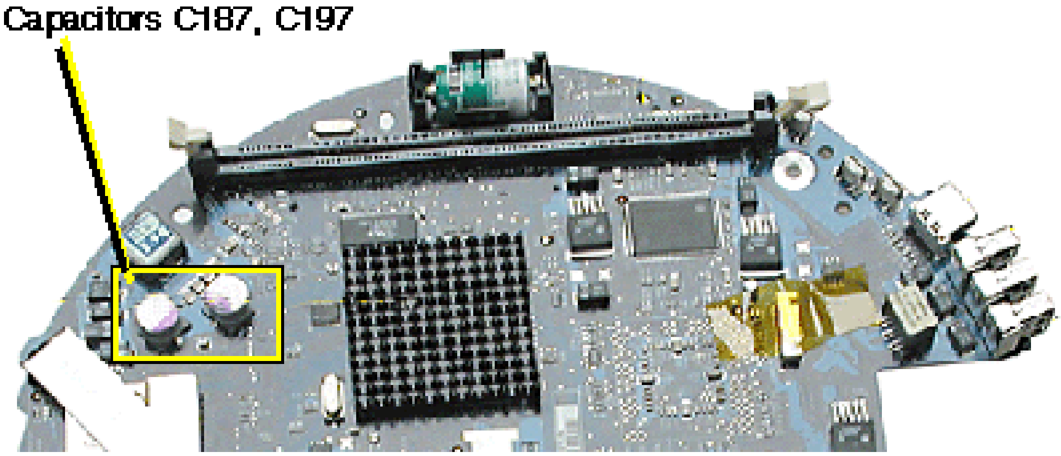
1. Verify the power outlet is good. Plug a different device into the socket to ensure there is power, or plug computer into another outlet.
2. Check the power cord. Use a known good power cord.
3. Check connection of the power cord on both ends. Verify that the plug is securely plugged into both the A/C outlet and back of the computer.
4. Remove keyboard, mouse, and other peripherals such as speakers.
5. Disconnect the power cord, place the computer in the service stand, and remove the user access plate.
6. Reset PMU. Refer to “Resetting the PMU on the Logic Board” mentioned earlier in this chapter or Kbase article 95165 .
7. Verify the battery is good before replacing modules. A drained battery may be indicative of a crashed Power Management Unit. Does the battery measure at least +3.5v? If not, replace the battery and reset the PMU. If the battery does measure over +3.5v, reinstall the battery and reset the PMU.
8. Connect the diagnostic cables (part 076-0897) between the upper housing components and the logic board. Refer to “Service Cables” mentioned earlier in this chapter.
9. Check the AC line filter. To measure power at the AC line filter cable, disconnect the AC line filter cable from the power supply cable. Switch your multimeter to read AC voltage. Touch the black probe to the pin of the brown wire, and touch the red probe to the pin of the blue wire (see graphic below). Do you measure 120v (line voltage)? If yes, go on to step 10. If no, replace the AC Line Filter.



10. Check power supply output. Disconnect the diagnostic power cable from the power supply connector, and measure power at the power supply connector by touching the black probe to the ground pin, and using the red probe to measure power at the pins indicated in thegraphic below. Did you measure +12v at each point? If yes, continue with the next step. If no, replace the power supply.



11. Check the main logic board voltages. Measure for +12v DC at capacitors C187 and C197 (identified in graphic below). Ground the black probe to the logic board screw next to the battery, and touch the red probe to the positive node at capacitor C187, and then at capacitor C197. Do you measure +12v? If yes, go on to the next step. If no, replace the logic board.

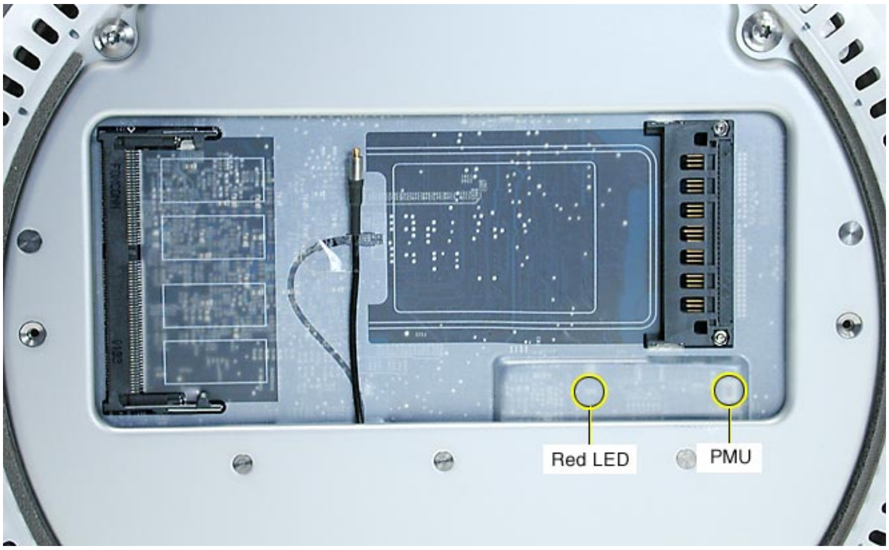


12. Replace power supply.
13. Replace the logic board.
14. Replace the inverter board.
15. Replace neck assembly.

No Video

No video or intermittent video

1. Reset parameter RAM. Press Command-Option-P-R during startup before “Welcome to Macintosh” appears.
2. The system software could be damaged. Start up from the system CD that came with the computer.
3. Remove the user access panel. With the unit powered on, check if a red LED (shown below) is visible in the access door. If the red LED is on, power is on.



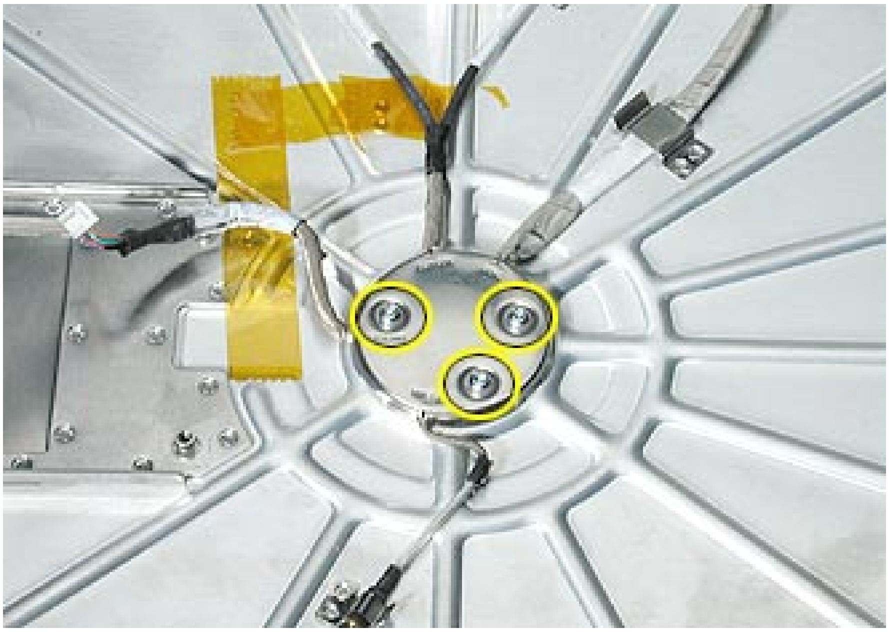
4. Disconnect the A/C power cord. Place the unit in the service stand and remove the user access plate. Press the PMU reset button on the logic board. Refer to “Resetting the PMU on the Logic Board” mentioned earlier in this chapter.
5. Check for external video. Connect an external monitor to the mini-VGA port.
6. Open the bottom housing and verify that all the cables are securely attached. Pay special attention to the video cable (located near the modem).
7. Check the connection of the video cable to the LCD flat panel display (under copper tape).
8. Replace the inverter board.
9. Replace the LCD display.
10. Replace the neck assembly
11. Replace the logic board.
12. Replace the power supply board.

Display

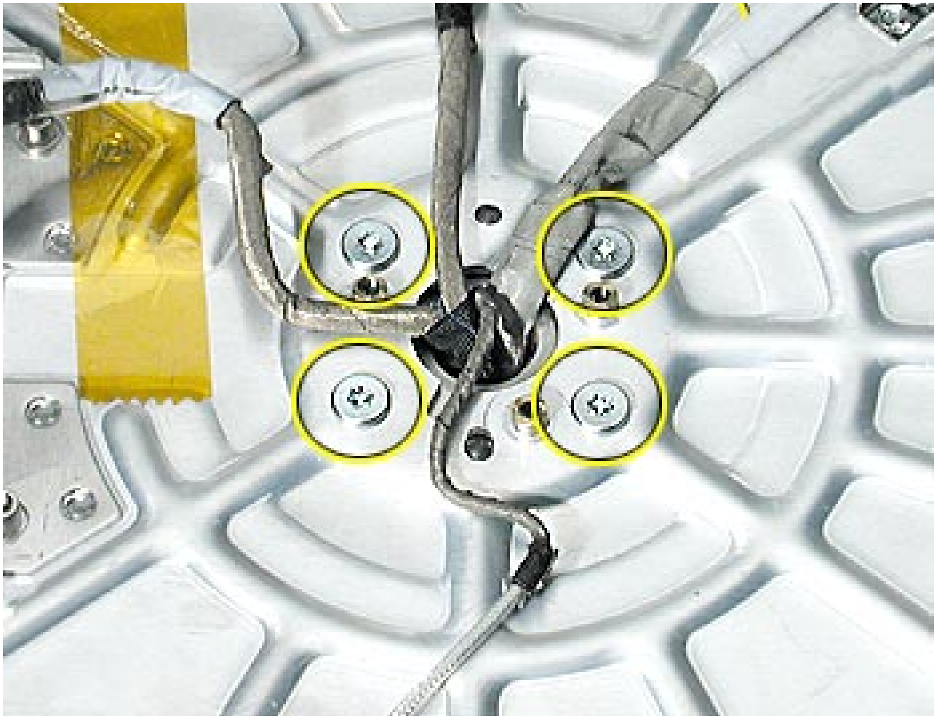
Screen tilts to the left or the right even after a manual adjustment.

Note: It is normal for the screen on an iMac (Flat Panel) to have a small amount of horizontal play. However, the screen should be able to be adjusted so that it will stay in a level horizontal position.

1. Remove ten screws connecting the back cover to the flat panel LCD display (refer to the Take Apart chapter, display topic).
2. Disconnect the panel cables to gain access the three screws on the metal cable retainer shown below. Remove the screws and lift the cable retainer off the panel shield.



3. Loosen the four screws (shown below) that hold the panel shield to the neck assembly, and tilt the screen the opposite direction of the tilt.



4. While holding the display bezel in this position, tighten the same four screws that hold the panel shield to the neck assembly.
5. Replace the panel and check that the display is now horizontally level.

Hard Drive

Hard Drive won’t mount to the desktop

1. Disconnect any connected peripherals.
2. Boot from the system CD that came with the computer and see if the hard drive mounts on the desktop.
3. Launch Drive Setup and update the hard drive driver.
4. If no hard drive is found in Drive Setup, verify the hard drive cable connections.
5. Replace the hard drive cable.
6. Replace the hard drive.
7. Replace the logic board.

Flashing question mark appears on the screen

1. Boot from the system CD that came with the computer and see if the hard drive mounts on the desktop.
2. Launch Drive Setup and update the hard drive driver.
3. If no hard drive is found in Drive Setup, verify the hard drive cable connections.
4. Replace the hard drive cable.
5. Reinstall the software drivers for the hard drive.
6. Reinstall system software. Backup the data first.
7. Reinitiation the hard drive.
8. Replace the hard drive.
9. Replace the logic board.

System hangs during normal startup process

1. Boot from the system CD that came with the computer and see if the hard drive mounts on the desktop.
2. Using Drive Setup, reinstall the system software drivers for the hard drive.
3. Using Drive Setup, reinitiation the hard drive.
4. Check all cable connections to and from the hard drive.
5. Replace the hard drive cable.
6. Replace the hard drive.
7. Replace the logic board.

Optical Drive

CD or DVD won’t mount to the desktop

1. Try cleaning the disc. If it is dirty or scratched, it may not mount.
2. Try a different disc.
3. Boot from Apple Hardware Test (hold down the “C” key at startup) or boot from the system install CD (use Startup Manager, hold down the Option key at startup).
4. Perform a clean install with the CD that came with the computer.
5. Replace the optical drive cable.
6. Replace the optical drive.
7. Replace the logic board.

Can’t boot from the CD or DVD

1. Try cleaning the disc. If it is dirty or scratched, it may not mount.
2. Try a different disc.
3. Boot from Apple Hardware Test (hold down the “C” key at startup) or boot from the system install CD (use Startup Manager, hold down the Option key at startup).
4. Perform a clean install with the CD that came with the computer.
5. Replace the optical drive cable.
6. Replace the optical drive.
7. Replace the logic board.

CD or DVD constantly ejects

1. Disconnect all peripheral devices, especially the mouse in cases where the disc is constantly ejecting.
2. Try cleaning the disc. If it is dirty or scratched, it may not mount.
3. Try a different disc.
4. Boot from Apple Hardware Test (hold down the “C” key at startup) or boot from the system install CD (use Startup Manager, hold down the Option key at startup).
5. Perform a clean install with the CD that came with the computer.
6. Replace the optical drive cable.
7. Replace the optical drive.
8. Replace the logic board.

Sound Out

No sound from either internal or external speakers

1. Verify volume setting is correct in system preferences.
2. Replace the external speakers or headphone in question with a known-good device.
3. Reset parameter RAM. Press Command-Option-P-R during startup before “Welcome to Macintosh” appears.
4. Verify internal speaker cable is connected.
5. Replace the internal speaker.
6. Replace the logic board.

Sound In

No sound is recorded

1. Check setup of the system preferences for the microphone.
2. Check the microphone cable connection.
3. Replace the internal microphone.
4. Replace the neck assembly.

Error Beep(s)

Computer beeps at startup.

1. RAM expansion DIMMs for the iMac must be PC133 compliant and use SDRAM devices. If the user installs a DIMM that uses EDO or SGRAM devices, the computer will beep several times when the user attempts to restart the computer.
2. Refer to “Power-On Self Test” mentioned earlier in this chapter.

Modem

No modem dial tone

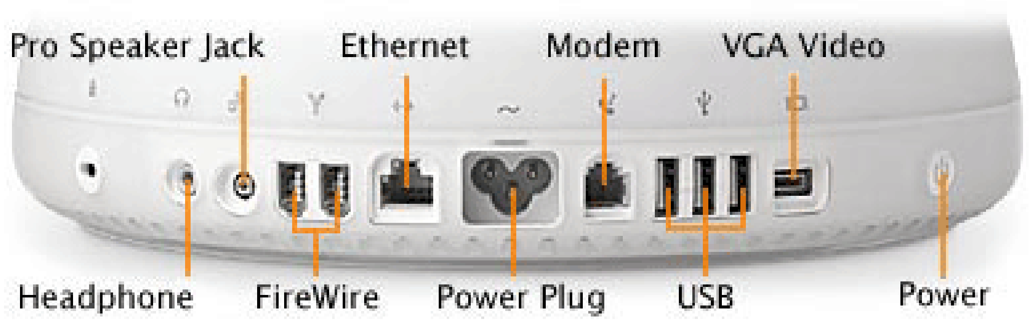
1. Verify known-good analog (not digital) telephone line.
2. Verify known-good RJ-11 telephone cable.
3. Verify RJ-11 cable is not plugged into Ethernet port.
4. Inspect RJ-11 connector and modem port for pin damage.
5. Verify RJ-11 cable is firmly installed in the modem port.
6. Verify correct modem driver is installed and the correct CCL is selected. If the problem persists, reinstall system software.
7. Open the bottom housing. Verify the internal RJ-11 modem cable is connected to the modem.
8. Replace the RJ-11 board.
9. Replace the modem.
10. Replace the logic board.

I/O Ports

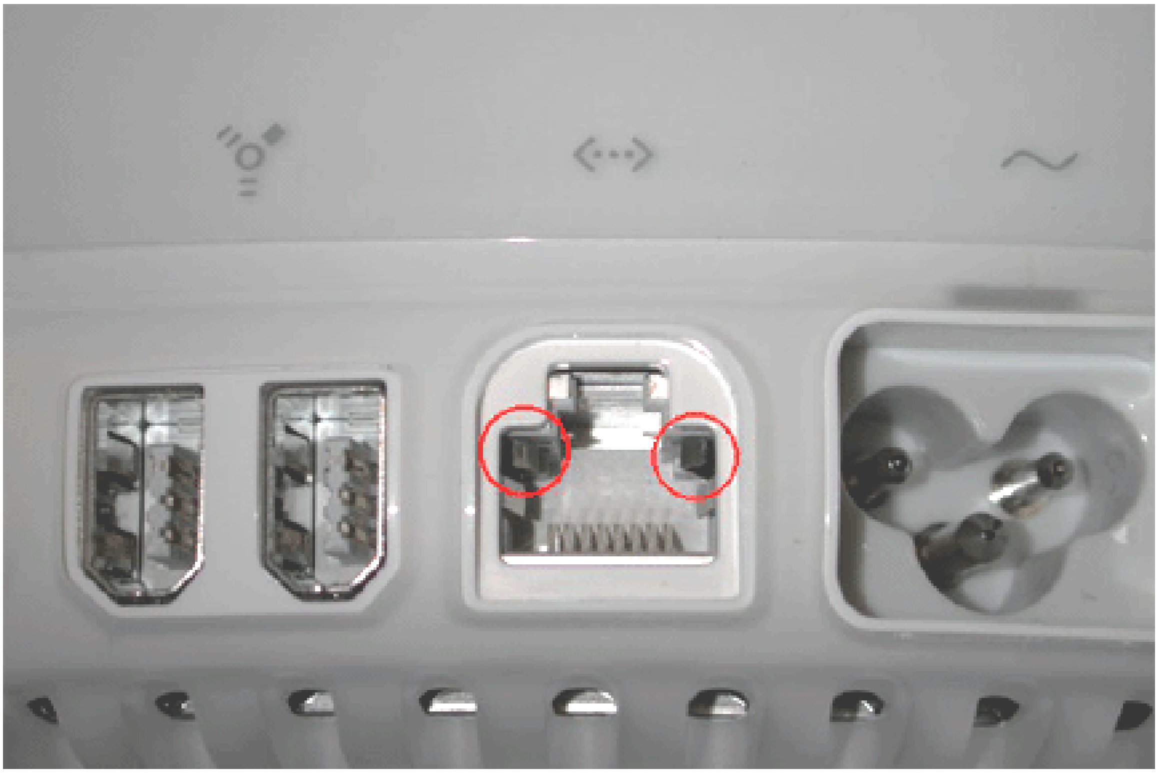
Difficulty Plugging in an Ethernet Cable

Note: The Ethernet port on an iMac (Flat Panel) has a special mechanism to prevent modem cables from accidentally being inserted. In some cases, this mechanism can cause difficulty when attempting to plug in an Ethernet cable.

1. Verify that you are plugging into the Ethernet port. See graphic below.


Pro Speaker Jack
Ethernet
Modem
VGA Video
Headphone
FireWire
Power Plug
USB
Power

2. Notice that the port has two metal tabs (circled below) which prohibit the use of a modem cable.



3. When inserting the Ethernet cable, try holding the cable at a slight angle and wiggle the connector to get past the metal tabs.

4. Once the connector has passed the metal tabs it should slide in with no further difficulty.

USB Printing Problems

iMac cannot print to attached known-good printer.

1. Verify that the printer is Macintosh compatible.
2. Verify that you have setup the printer correctly in OS X.
3. Reinstall the printer driver.
4. Switch the printer to another USB port.
5. Replace the printer interface cable.
6. System software is corrupted. Reinstall the system software.
7. Replace the logic board.

Service Source

Exploded View

iMac (Flat Panel)

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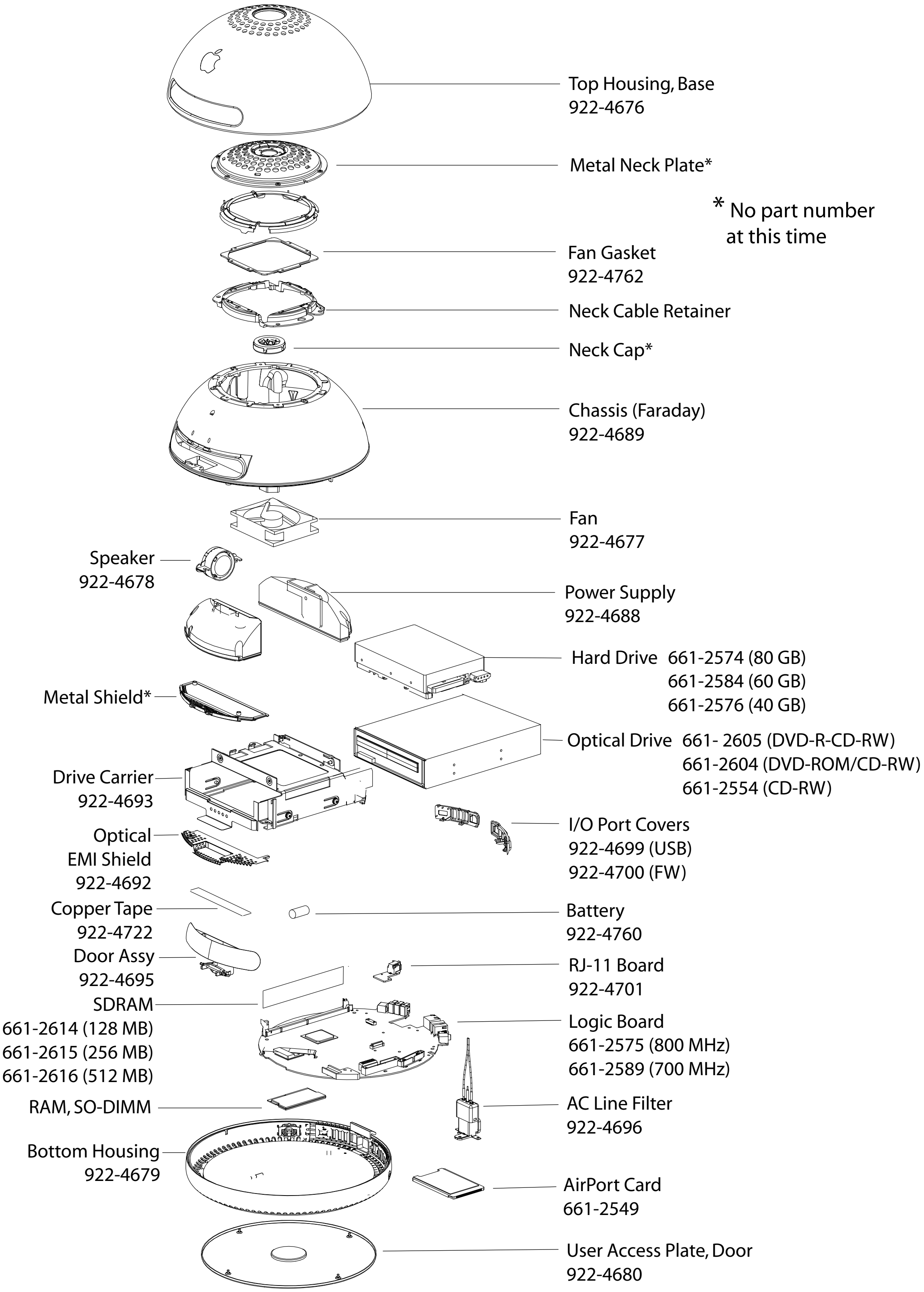
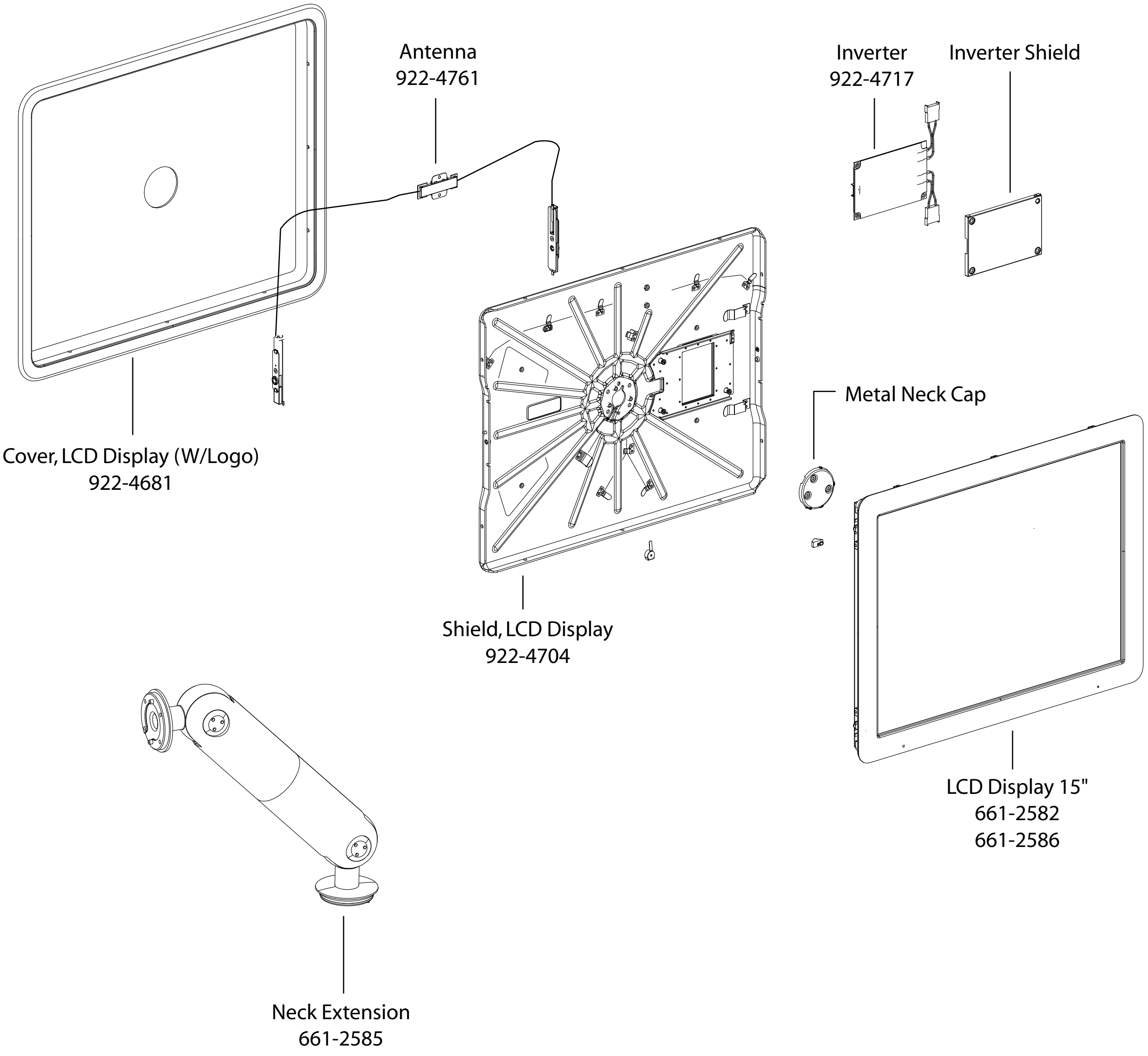
Base Unit

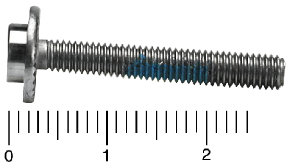

Top Housing, Base
922-4676
Metal Neck Plate*
Fan Gasket
922-4762
Neck Cable Retainer
Neck Cap*
Chassis (Faraday)
922-4689
Fan
922-4677
Speaker
922-4678
Power Supply
922-4688
Hard Drive 661-2574 (80 GB)
661-2584 (60 GB)
661-2576 (40 GB)
Metal Shield*
Optical Drive 661- 2605 (DVD-R-CD-RW)
661-2604 (DVD-ROM/CD-RW)
661-2554 (CD-RW)
Drive Carrier
922-4693
I/O Port Covers
922-4699 (USB)
922-4700 (FW)
Optical
EMI Shield
922-4692
Copper Tape
922-4722
Battery
922-4760
Door Assy
922-4695
RJ-11 Board
922-4701
SDRAM
661-2614 (128 MB)
661-2615 (256 MB)
661-2616 (512 MB)
Logic Board
661-2575 (800 MHz)
661-2589 (700 MHz)
RAM, SO-DIMM
AC Line Filter
922-4696
Bottom Housing
922-4679
AirPort Card
661-2549
User Access Plate, Door
922-4680

* No part number at this time

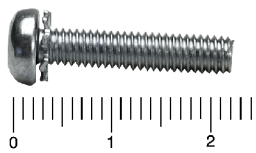

Antenna
922-4761
Inverter
922-4717
Inverter Shield
Cover, LCD Display (W/Logo)
922-4681
Metal Neck Cap
Shield, LCD Display
922-4704
LCD Display 15"
661-2582
661-2586
Neck Extension
661-2585

iMac (Flat Panel) Screw Matrix

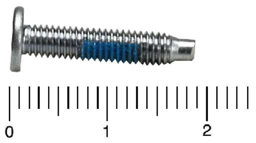
In Centimeters



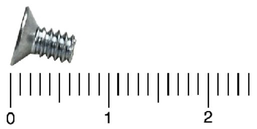
Bottom Housing Bolts
(4)
T-15 922-5104



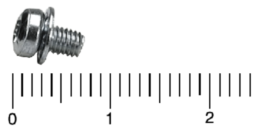
Grounding Screw to Faraday
(1)
T-15 922-4714



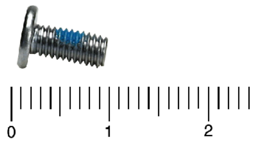
Speaker (2)
Power Supply (4)
Drive Carrier to Faraday (4)
T-10 922-4709



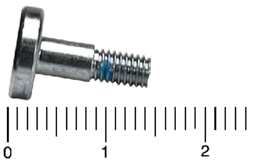
Hard Drive to Carrier to Assy
(4)
T-10 922-5105



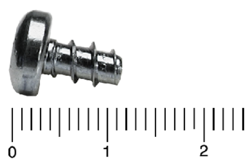
Optical Drive to Carrier Assy
(4)
T-10 922-5107



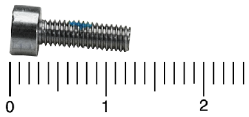
Power Supply Shield (2)
Metal DVD Shield (2)
T-10 922-4707



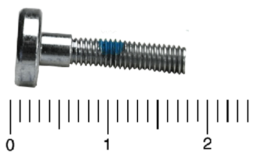
Fan
(2)
T-15 922-4710



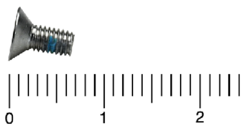
Fan Bracket
(2)
T-25 922-4708



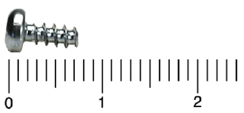
Door Hinge
(2)
T-10 922-5108



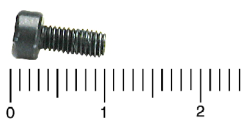
Blind Mate Connector
(2)
T-10 922-5109



Faraday to Outer Shell
(2)
T-10 922-5106

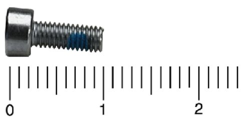


Faraday Under Logo
(1)
T-8 922-4706



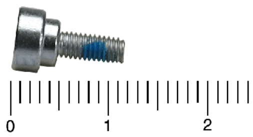
White Plastic Cap

2 Black
T-10 922-5110

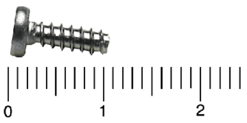


White Plastic Cap
3 Silver

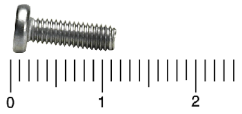
T-10 922-5111



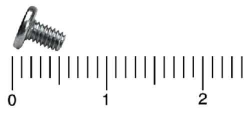
White, Plastic Neck
Cable Retainer
(4)
T-10 922-5112



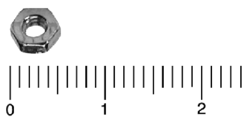
LCD Bezel
(10)
1.5 mm Hex 922-4716



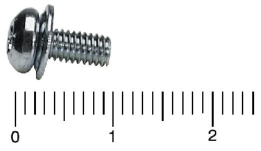
Antenna to LCD Bezel
(2)
1.5 mm Hex 922-5114



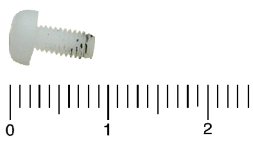
Inverter (3)
Metal Neck Biscut (3)
T-10 922-4723



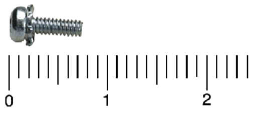
Nut, Antenna
5 mm 922-4724



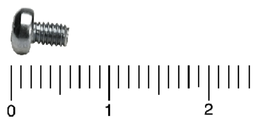
Logic Board, Metal (3)
T-15 922-4715



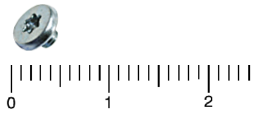
Logic Board, Plastic (1)
Phillips 0 922-5113



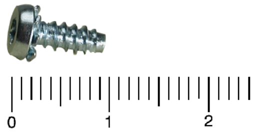
RJ-11 Board (2)
T-6 922-5115



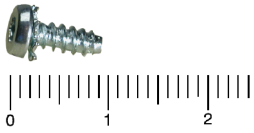
Modem (2)
T-8 922-5116



AC Line Filter
(2)
T-10 922-5117



LCD Panel Clip
(4)
T-10 922-5118

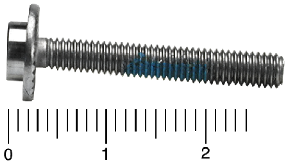


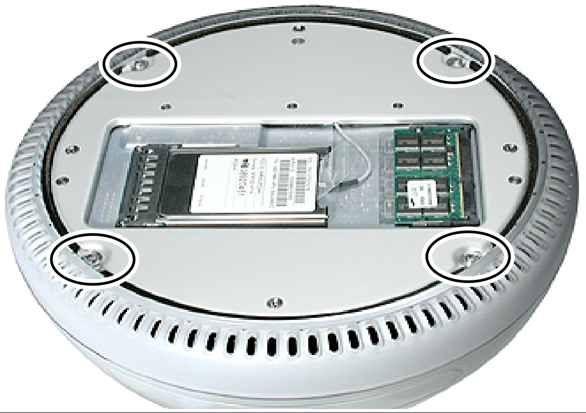
LCD to Frame
(4)
T-10 922-5119

iMac (Flat Panel) Screw Locator - 1 of 7

Bottom Housing Bolts (4)

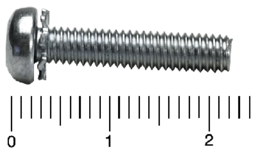
T-15, 922-5104

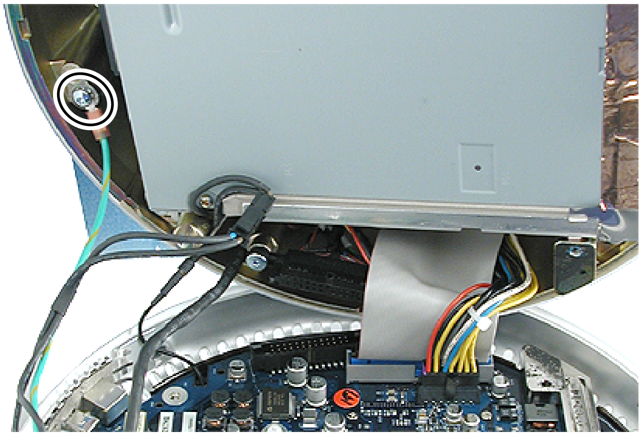




Grounding Screw to Faraday (1)

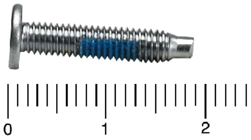
T-15, 922-4714

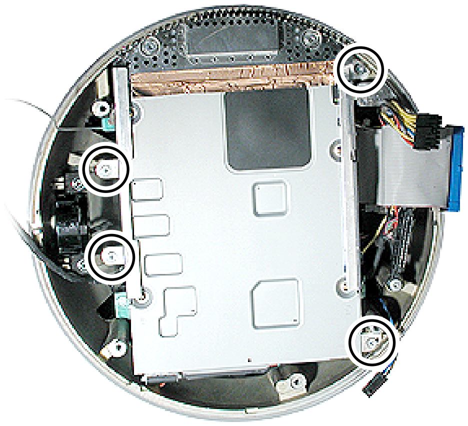




Drive Carrier to Faraday (4)

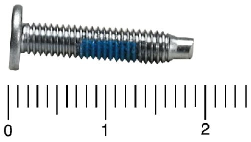
T-10, 922-4709

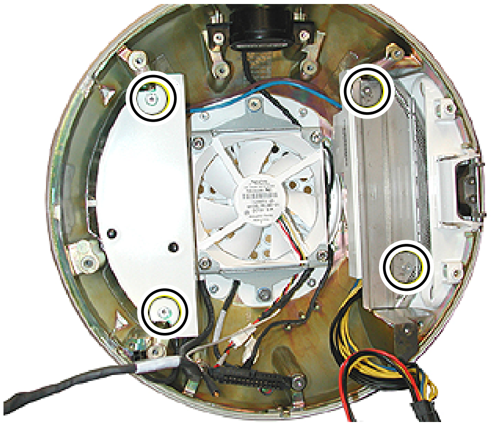




Power Supply (4)

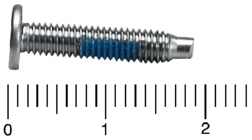
T-10, 922-4709

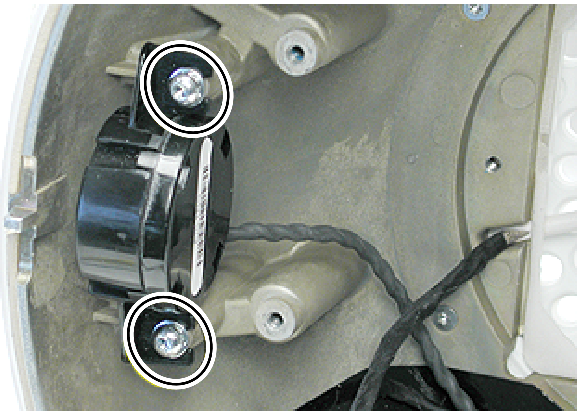




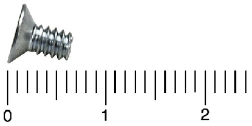
iMac (Flat Panel) Screw Locator - 2 of 7

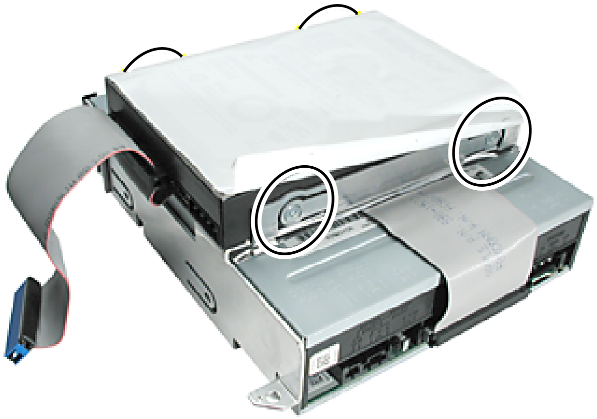
Speaker (2)
T-10, 922-4709



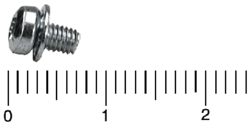


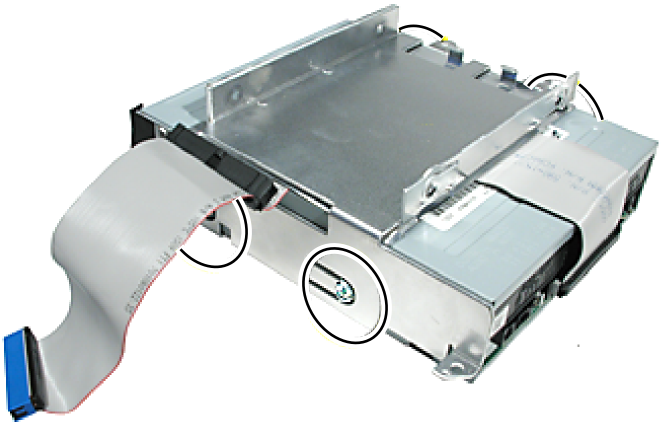
Hard Drive to Carrier to Assy (4)
T-10, 922-5105



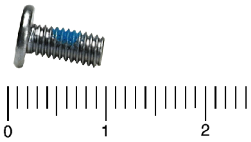


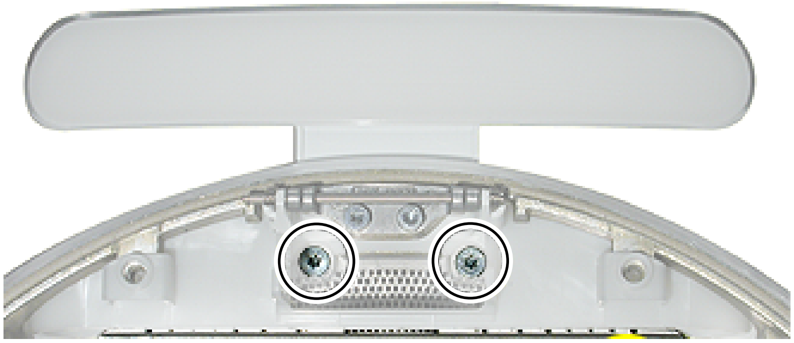
Optical Drive to Carrier Assy (4)
T-10, 922-5107





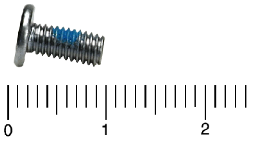
Power Supply Shield (2)
T-10, 922-4707

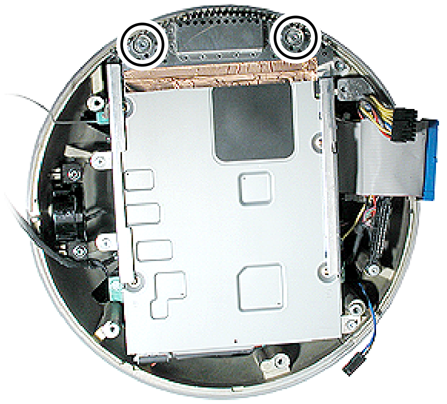




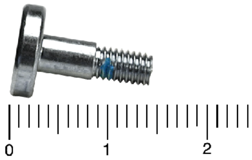
iMac (Flat Panel) Screw Locator - 3 of 7

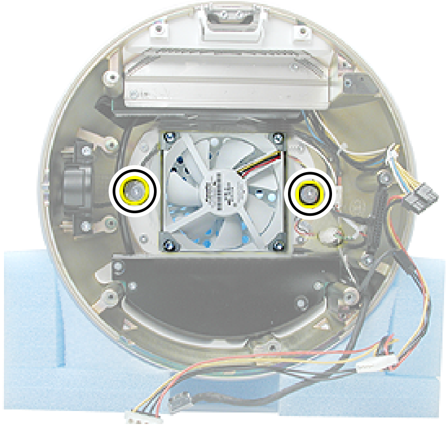
Metal DVD Shield (2)
T-10, 922-4707



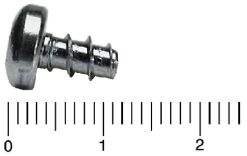


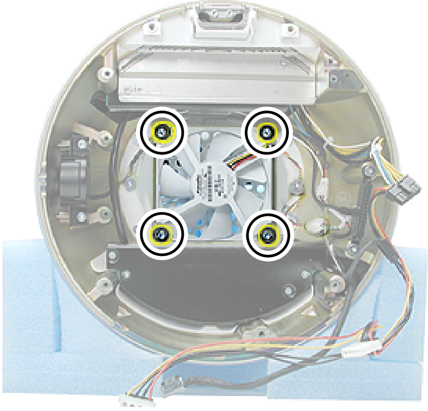
Fan (2)
T-15, 922-4710



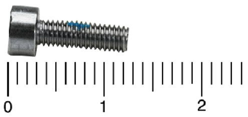


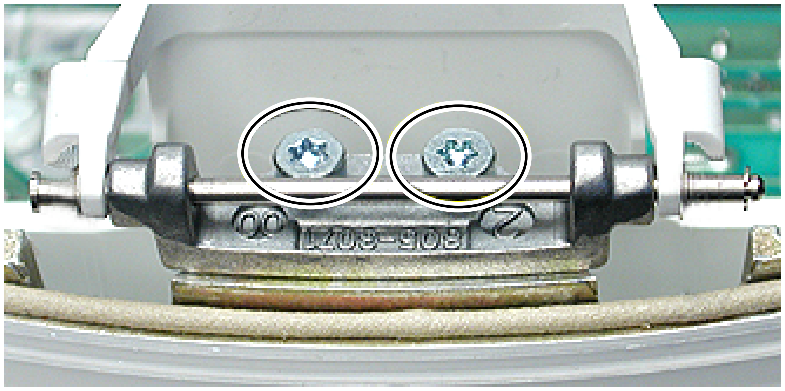
Fan Bracket (2)
T-20, 922-4708





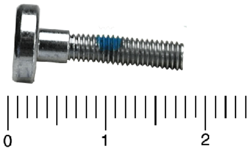
Door Hinge (2)
T-10, 922-5108

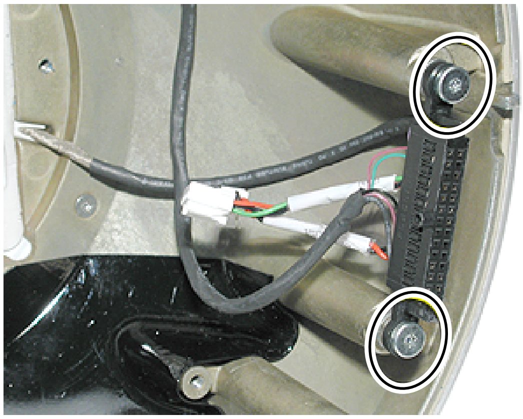




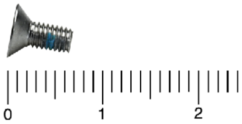
iMac (Flat Panel) Screw Locator - 4 of 7

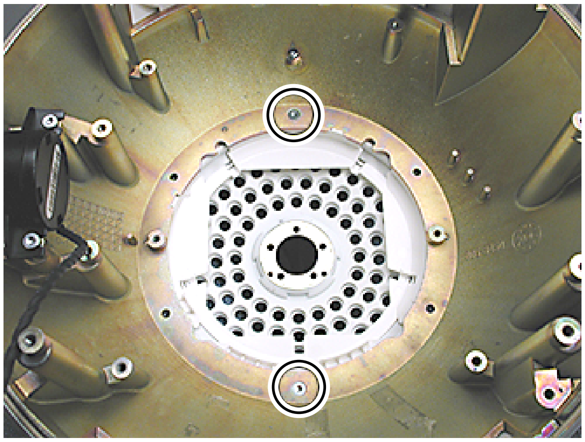
Blind Mate Connector (2)
T-10, 922-5109



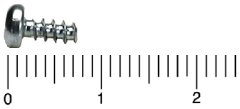


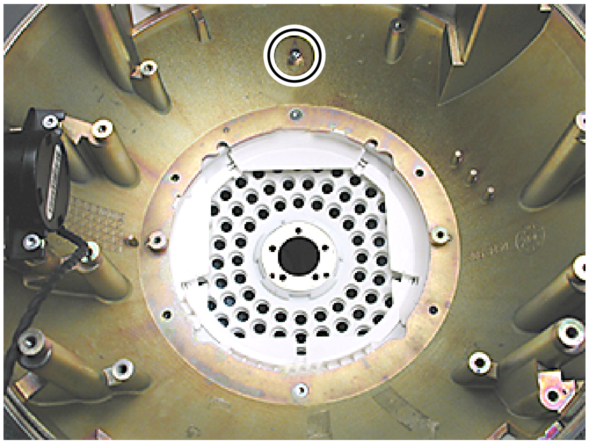
Faraday to Outer Shell (2)
T-10, 922-5106



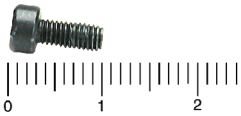


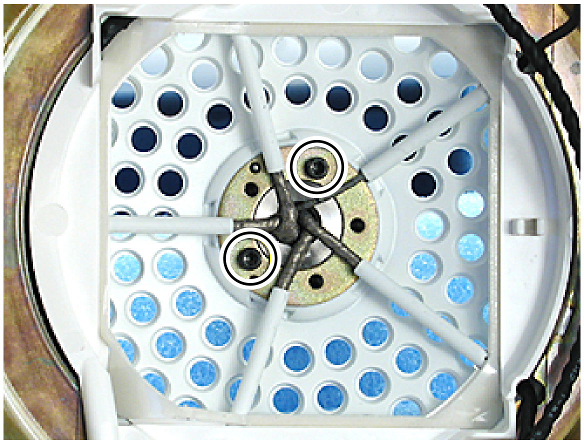
Faraday Under Logo (1)
T-8, 922-4706





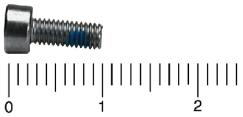
White Plastic Cap
2 Black, 922-5110
T-10

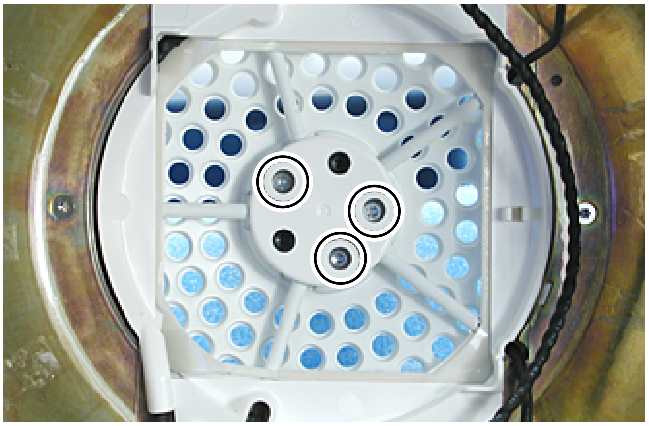




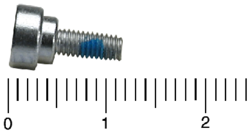
iMac (Flat Panel) Screw Locator - 5 of 7

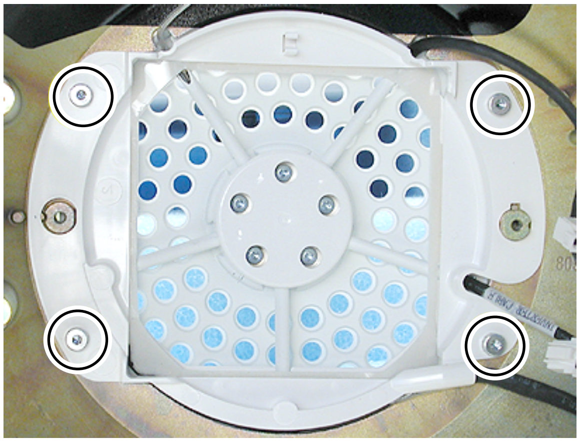
White Plastic Cap
3 Silver
T-10, 922-5111



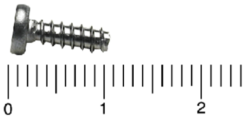


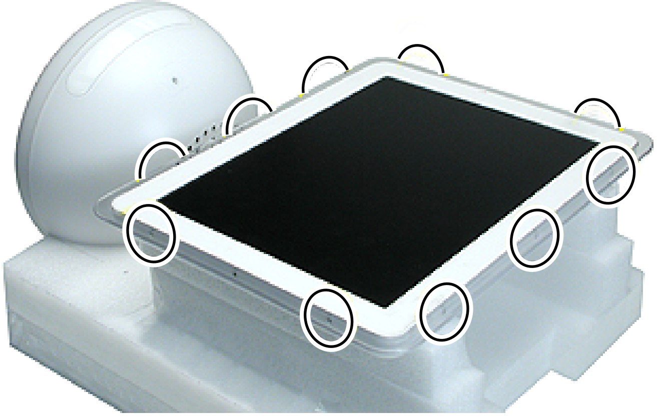
White, Plastic Neck
Cable Retainer (4)
T-10, 922-5112



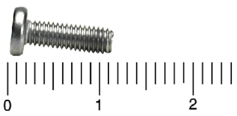


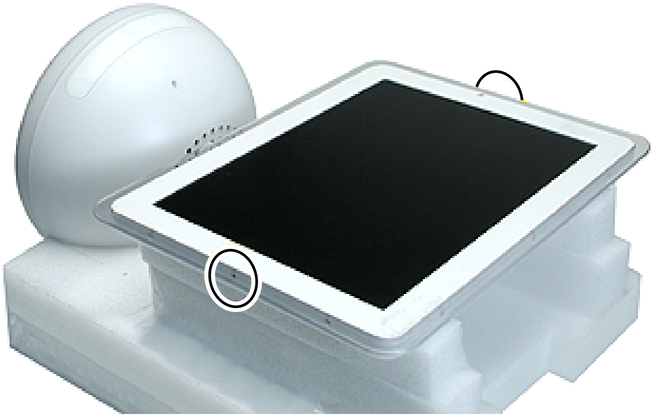
LCD Bezel (10)
1.5 mm Hex, 922-4716





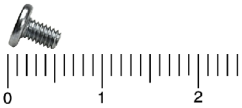
Antenna to LCD Bezel (2)
1.5 mm Hex, 922-5114

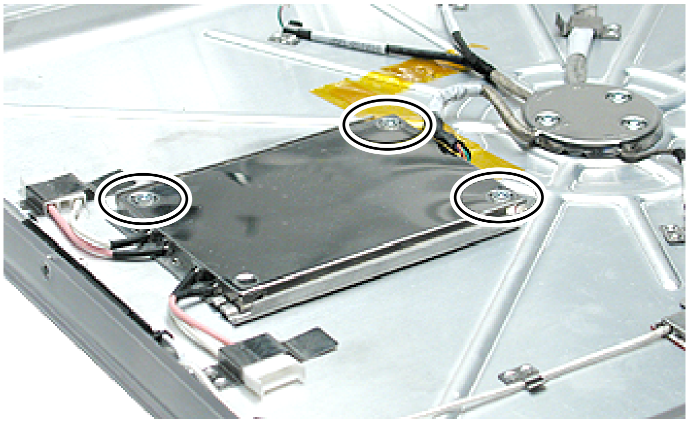




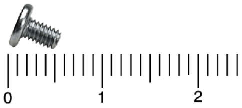
iMac (Flat Panel) Screw Locator - 6 of 7

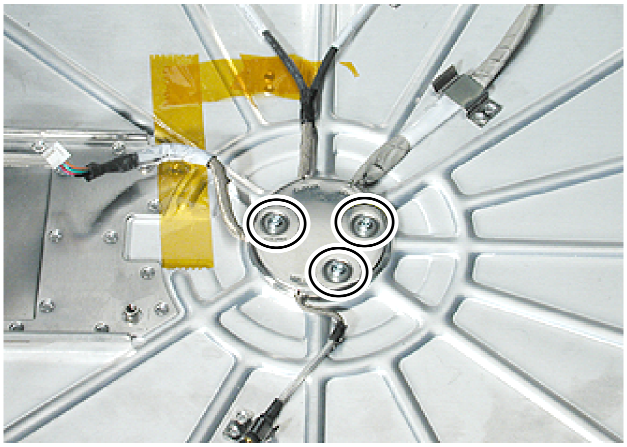
Inverter (3)
T-8, 922-4723



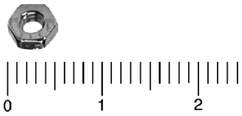


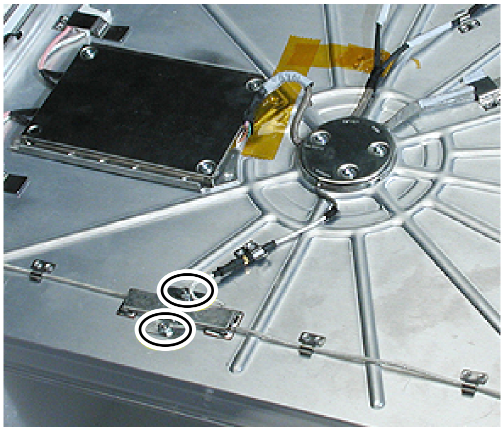
Metal Neck Biscut (3)
T-8, 922-4723



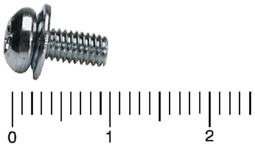


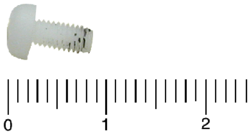
Nut, Antenna
5 mm, 922-4724

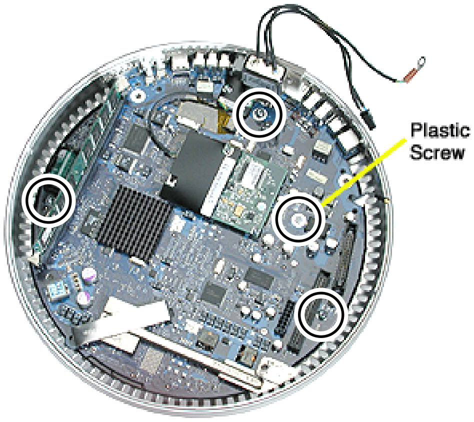




Logic Board,
Metal (3)
Plastic (1)
T-15, 922-4715 / 922-5113

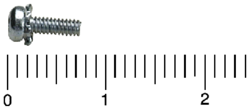


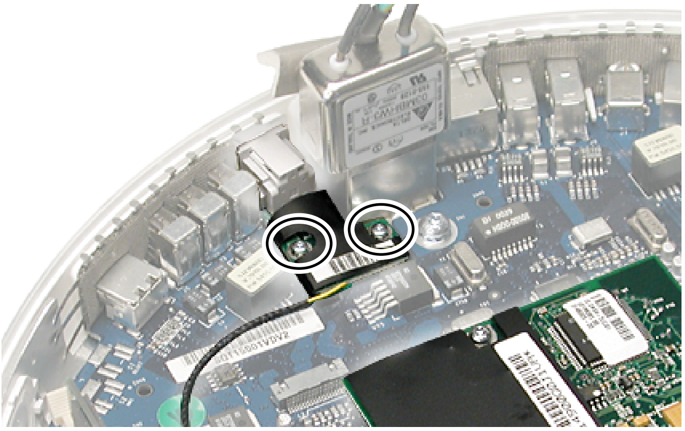



Plastic
Screw

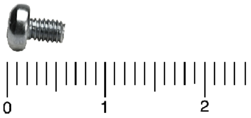
iMac (Flat Panel) Screw Locator - 7 of 7

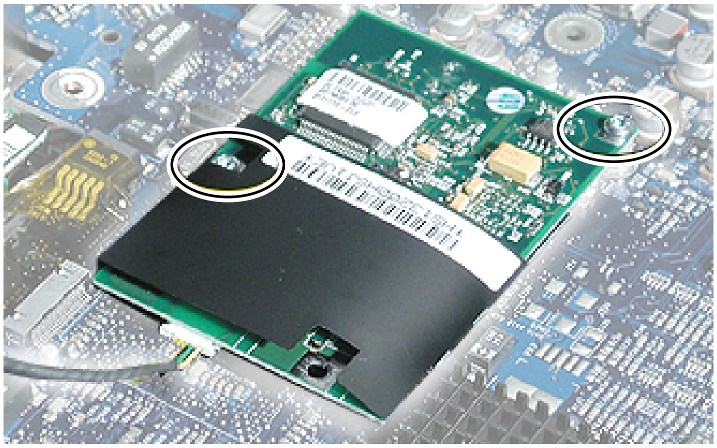
RJ-11 Board (2)
T-6, 922-5115



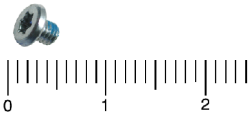


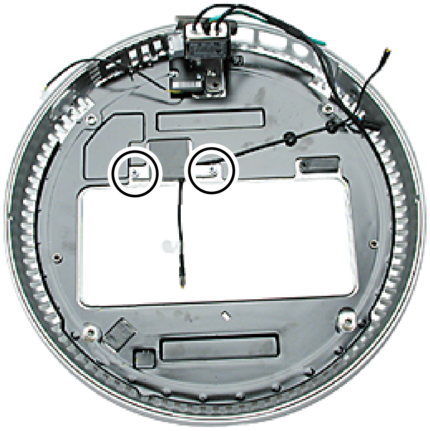
Modem (2)
T-8, 922-5116





Antenna Extension (2)
T-10





AC Line Filter (2)
T-10, 922-5117